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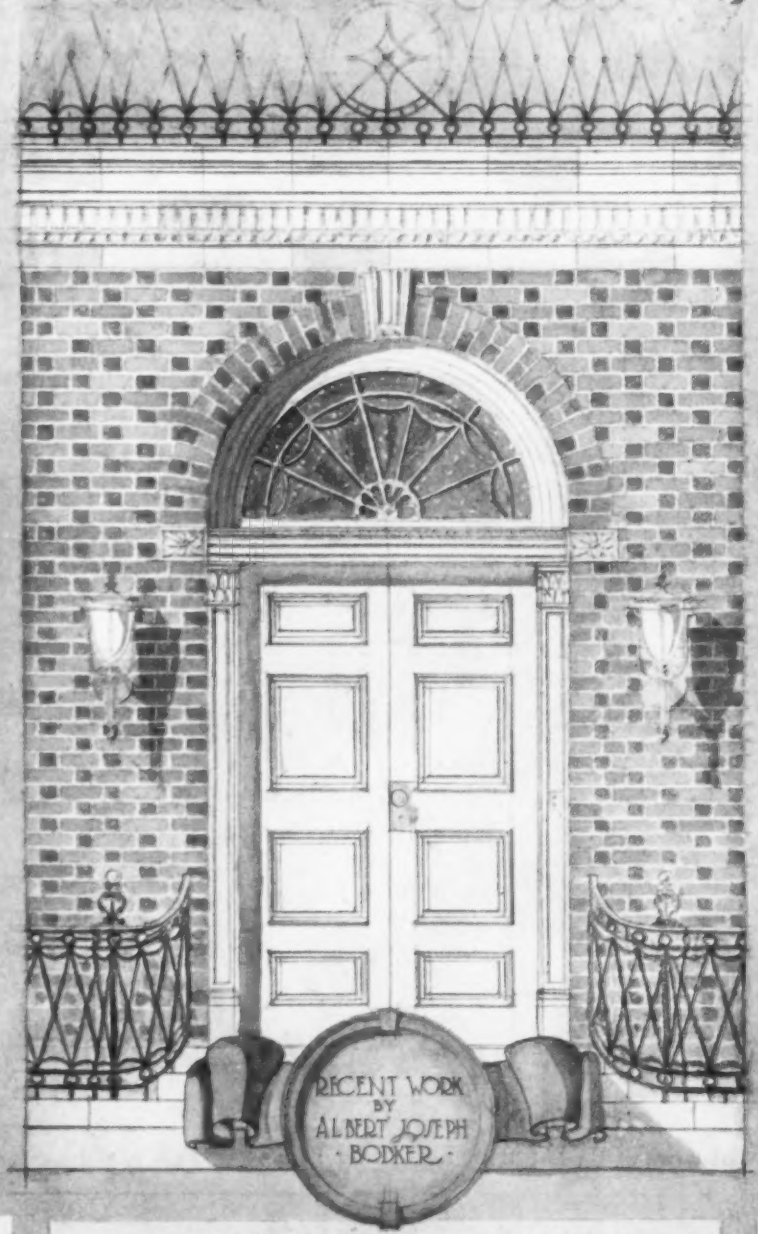

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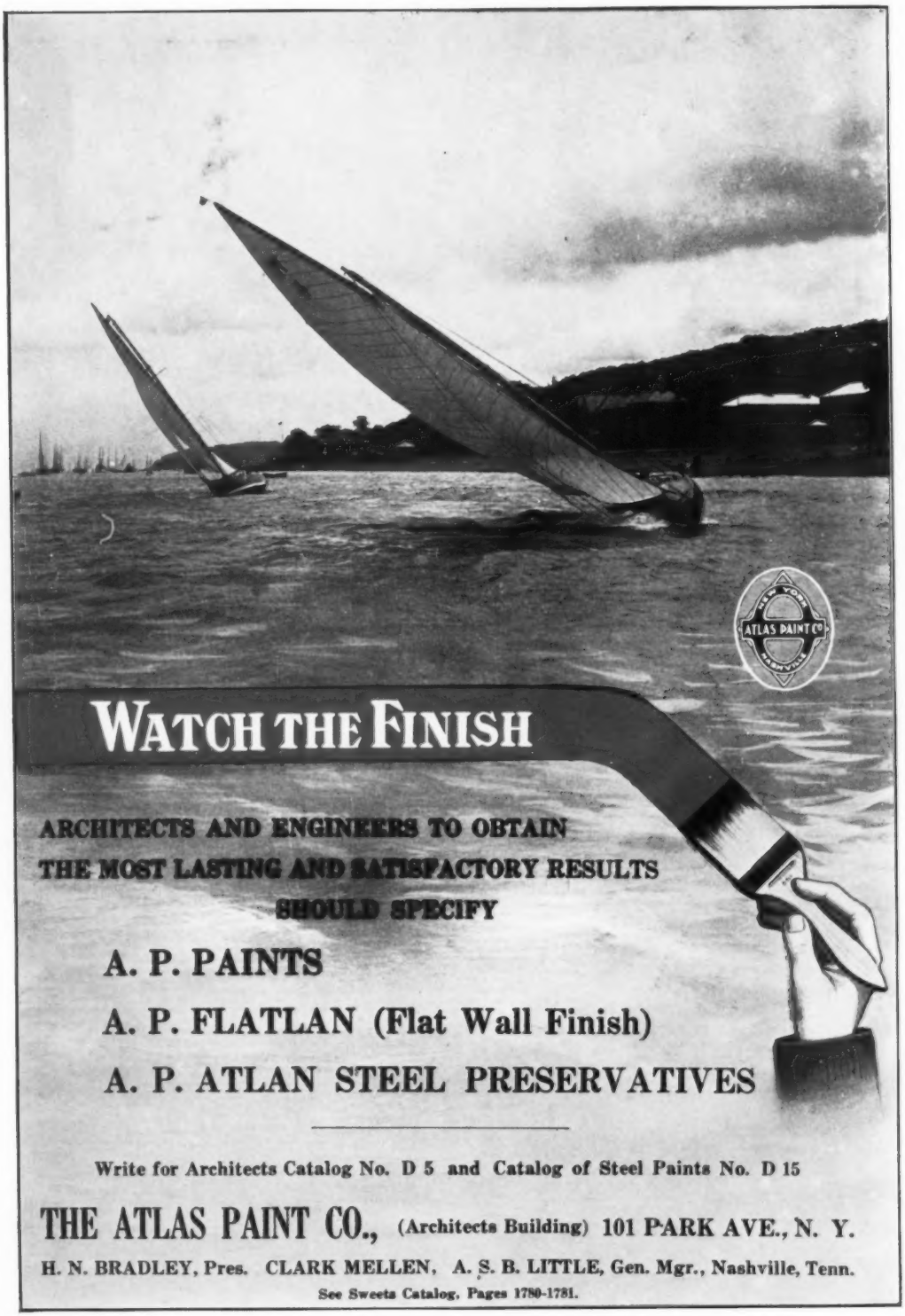
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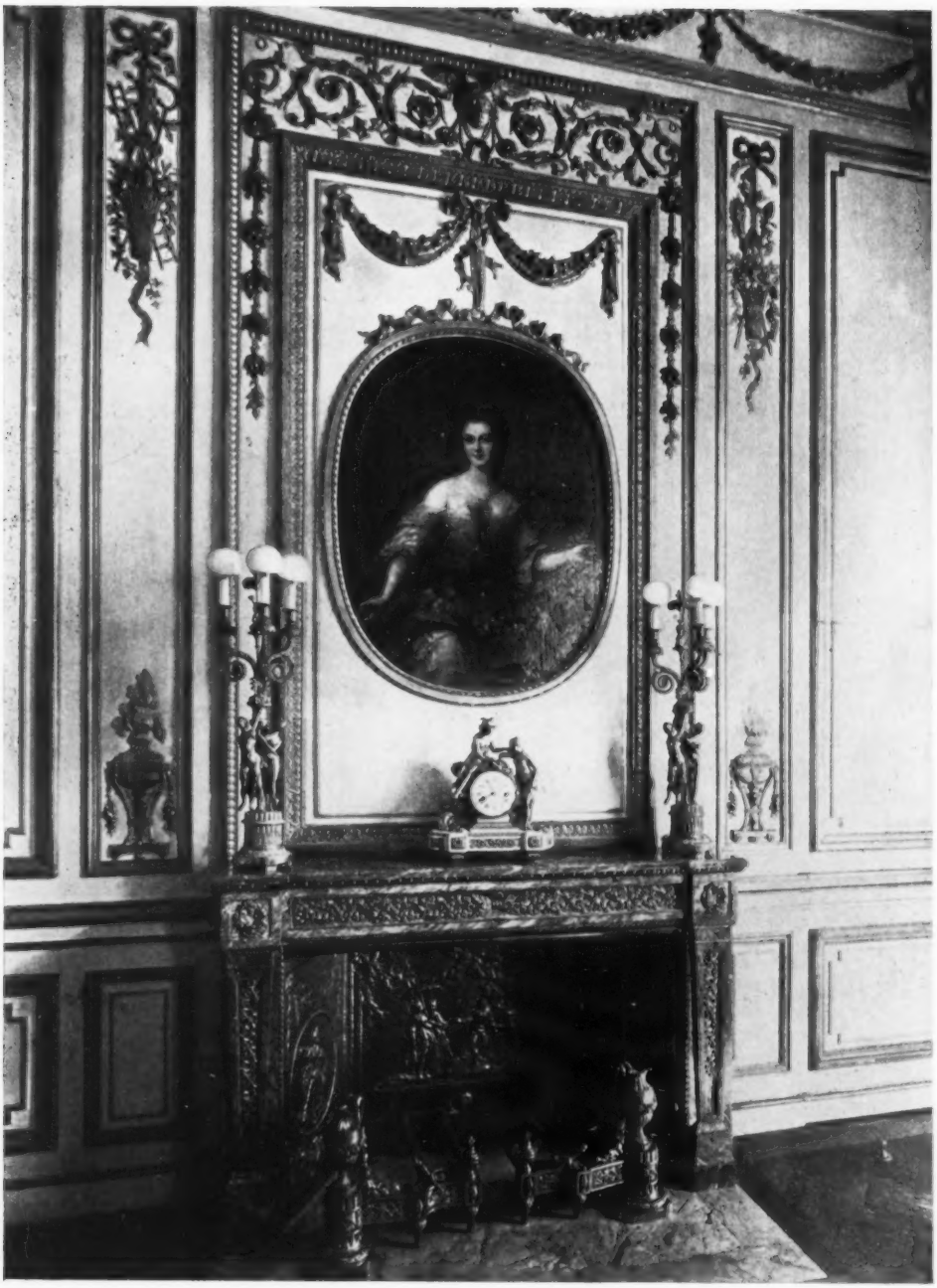


DETAIL OF OLD FRENCH WOODWORK AND MANTEL IN THE DINING ROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ. ALBERT JOSEPH BODKER, ARCHITECT.

THE
ARCHITECTVRAL
RECORD

MAY, 1913

VOLVME XXXIII NVMBER V

SOME RECENT WORK BY ALBERT JOSEPH BODKER

WITH NOTES ON VRBAN ARCHITECTVRE BY C. MATLACK PRICE

PHOTOGRAPHS BY FLOYD BAKER & OTHERS

I.

WHILE CONTENTIONS as to this or that "style" are rife among critics and dilettanti, and while some are bewailing the depravity of modern tendencies and others are smugly self-satisfied, it is rather an encouraging sign to notice that certain architects in this country are quietly and earnestly working out their own architectural salvation (as well as that of their profession at large) in buildings at once pleasing, dignified and well-mannered. And this, it is to be remarked, regardless of overstudied considerations of "period" or "style" as such.

The belief that precedent should be studied rather than copied seems to find a few intelligent supporters today, and to be the motive influence behind much sane and well-balanced design of recent years. To traverse the new Fifth Avenue in New York, with detours in the side streets immediately adjacent, is to realize this, and to read in it a strong and hopeful promise for the future.

Few types of building in this country have undergone such radical changes or seen such remarkable developments as the city house. Urban architecture at its best is by way of being a compromise an architectural solution of certain problems, many of which are not architectural. Plumbing, heating, comfortable disposition of a number of servants, elevators, dumb-waiter, service stairs, fire-

ENTRANCE VESTIBULE, RESIDENCE OF OAKLEIGH THORNE, ESQ.
Albert Joseph Bodker, Architect.

proofing—and above all, the building laws—would have worried Palladio or Peruzzi more deeply than the profile of moulding or the rustication of a base. Today our architect must be an "admirable Crichton." If he has more facilities at his beck than the old masters, by the same token his task is complex in an even greater ratio of proportion. He must think of many things besides the disposition of the façade, the paintings on the ceilings or the entasis of a column. He may create an architectural masterpiece, but his name will go down to perdition with his client if one of the electric call-bells fails to work, or a service door is hinged on the wrong side. In the design of the apartment house there are the same all-important and numberless little technicalities, but they are all standardized. They are all grouped under one general formula, more complex from year to year, it is true, but still a formula, and the architect may feel greater freedom in matters more directly concerning design. When he has complied with a certain set of fixed rules he is free to exercise his own ability and ingenuity as a designer. In the city house, however, there are the same general requirements of hygiene, fire protection, practical convenience and the mechanics of plumbing and electricity, but all subject to constant change, revision and variation at the hands of the owner, who, as he sometimes reminds the architect, is "putting up" the money, and must have a push-button three inches up or down or right or left if it necessitates redesigning an entire floor.

The point is that urban architecture today is a great deal more than architecture as understood in terms esthetic, and sometimes the proverbial needle's eye seems to the architect a wide portal in comparison with the way he must travel if he is to come forth not only the architect, but the *successful* architect of a modern city dwelling.

Perhaps it is not remarkable that many of our city houses are more practical than architectural, but rather that so many of them are architectural at all. Possibly some designers would not have detailed a cornice quite so great in projection for the Chesebrough house, but there is a contingency far more imminent than mere possibility that many designers would have done something far worse. Even if this particular were more noticeable, however, it would be more than offset by certain niceties in other details. There is a careful expression of scale in the minor divisions of the windows, as well as in their larger relations, and a general sense and of "fitness" which grows upon one leaves a pleasant impression.

It is interesting in this connection to know that Mr. Bodker spent a year in the earlier part of his career in the office of McKim, Mead and White—and to have known McKim is to know detail in terms never to be forgotten. The influence of a master architect may live long after his death, and it is not drawing too freely on the imagination to detect, in certain phases of this detail, some reminiscence of the master.

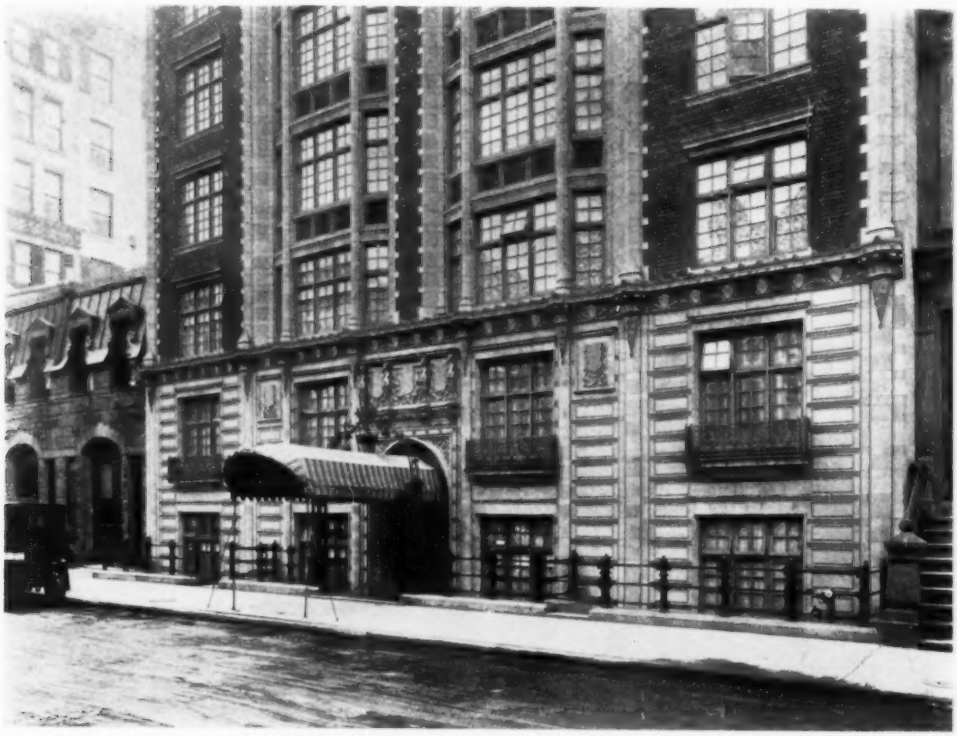
II.

A noticeably successful designer of the present day city house *de luxe* is Albert Joseph Bodker, whose work presents several interesting aspects, and who may be taken as one of those individuals alluded to before who are quietly and earnestly contributing to a sane and dignified sort of architecture in this country.

When his work is carefully studied, its character assimilated and the impression registered, it is interesting to know that he never studied in Paris—a fact which might be wielded mightily by those harsh critics of the school of the Beaux-Arts, whose pent-up feelings so often break out in bitter revilements of console and cartouche. That there is much of good in the French methods of "studying" a design cannot be denied by any intelligent architect or amateur. Yet even those who would give to the Beaux Arts every other letter in the alphabet cannot concede the alpha and omega as well, in the face of intrinsically and independently excellent examples from the hands of designers who never so much as sharpened a pencil in Paris.

One does not need to be proud of never having studied in the great *Ecole*, but one is permitted to be proud of obvious success which cannot be traced to that source.

Mr. Bodker's designs for apartment houses show, perhaps, a little more freedom in certain respects, but a commendable fitness for their purpose. It is an interesting fact, and an encouraging sign for the profession in America that real estate operators and owners are yearly attaching more and more importance to the architectural quality of the apartment houses which they erect. They are beginning to think that perhaps there is some relation between good architecture, or at least architecture which is "smart," and high rents. A five room



DETAIL OF AN APARTMENT HOUSE, NO. 40 EAST 62D ST., NEW YORK CITY.
Albert Joseph Bodker, Architect.

apartment in a new building on Park avenue might rent for seventy-five dollars a month, but if it can be described as four rooms and a "spacious foyer" the same suite will bring ninety or a hundred. So much for "architectural fashions." We are "foyer" mad, and while any plan which eliminates the old-fashioned long, dark apartment hall is a good one, there are considerations of light and spaciousness in some of the other rooms which must be taken account of. To return to the exterior design for a moment, there seems to be growing a definite ratio between the rental and the ability of the architect employed to design the house, and we can remember the old days when any speculative builder or general contractor undertook to put up apartments from his own "plans," or with plans procured as cheaply as possible. High architectural fees are now coming to be reckoned as an essential part of the initial investment by the owner and operator. It is to be inferred that the whole question is now regarded as a vastly important development from the fact of the establishment by the New York Chapter of the American Institute of Architects of "The Apartment House Medal." The significance lies in the fact that the medal is awarded not to the architect, but to the owner of the building approved by the jury. The aim is obviously to encourage and stimulate rivalry among owners and operators of city real estate to elevate all past standards of apartment house building. The points taken into consideration are the general excellence of exterior appearance, general good taste and architectural judgment regarding adjacent property, adaptability and cleverness of plan and honesty of construction.

This recognition by the American Institute of Architects, combined with the rising trend of popular demand and the corresponding rise of foresight and taste on the part of owners and syndicates,

MAIN ENTRANCE HALL, APARTMENT HOUSE, 393 PARK AVENUE, NEW YORK CITY.
Albert Joseph Bodker, Architect.

AN APARTMENT HOUSE, 393 PARK AVENUE, NEW YORK CITY.
Albert Joseph Bodker, Architect.

has led to developments paralleled in no other country. And American architects, even if they are not always original, are certainly adaptable in the ingenuity and enthusiasm which they bring to bear on new problems. The apartment house being such, they have brought to bear upon it all the native wit and invention with which, as a race, we are often credited by Europeans. For all that American architecture may be held up to deprecation, as a patchwork composite of borrowed motives and imported styles, no detractor can intelligently state or substantially prove that architects of any other country excel the American in practical matters of innovation, where no precedent obtains, and where sheer inventive ability alone counts. Certainly the apartment is a type of building in the design of which the architect must be his own law, must effect his own solutions of the problem in terms at once practical and esthetic.

It is evident that Mr. Bodker is to be reckoned as one of a number of architects who have devoted a good deal of study to the apartment house problem, with considerable success. In the exterior and interior sketches illustrated there is noticeable an able grasp of the fundamental ideas underlying this type of building. It is a little unfortunate that the speculative element in apartment house building often results in the

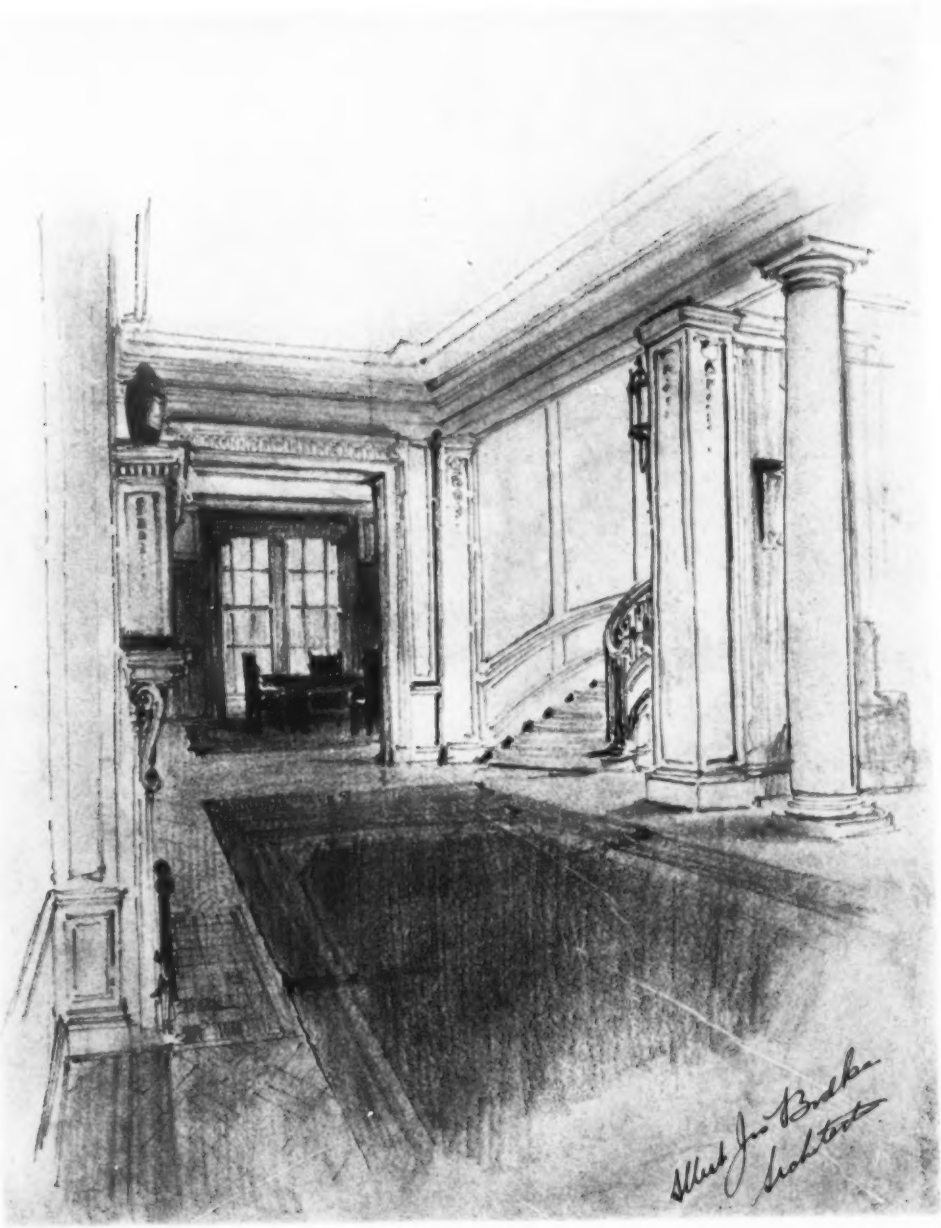
ENTRANCE DETAIL, APARTMENT HOUSE, 393 PARK AVENUE, NEW YORK CITY.
Albert Joseph Bodker, Architect.

SKETCH FOR AN APARTMENT HOUSE.
ALBERT JOSEPH BODKER, ARCHITECT.

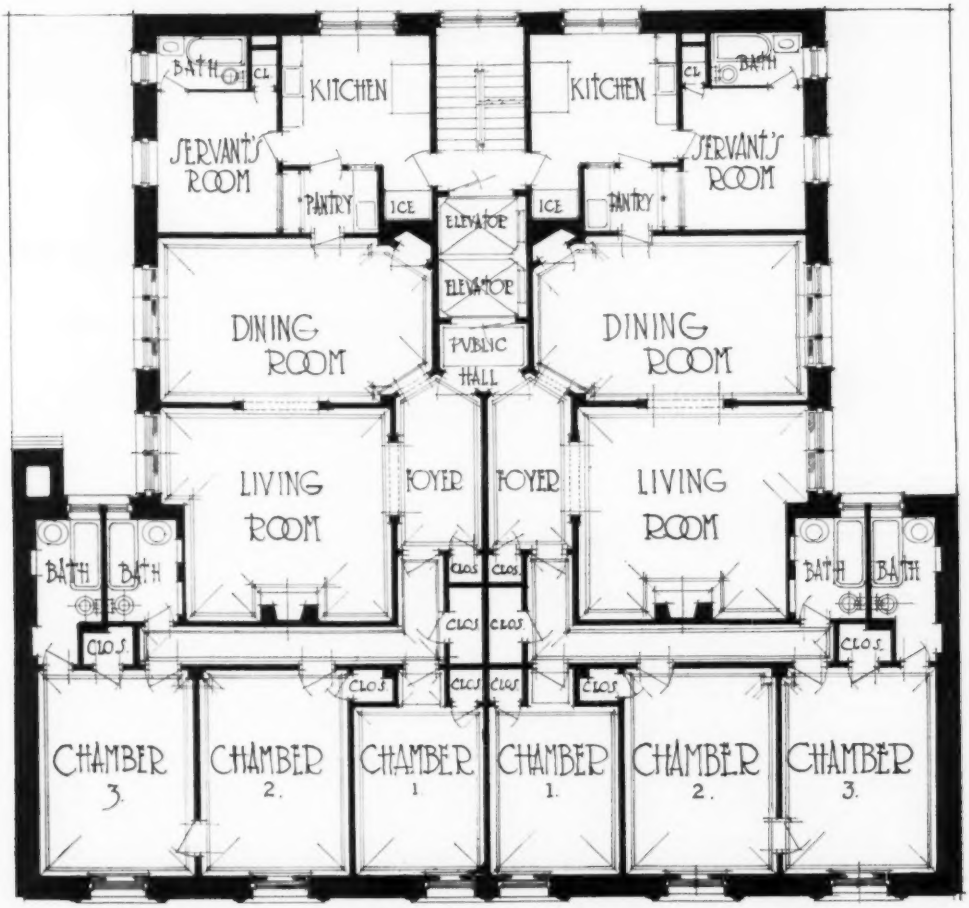
AN APARTMENT HOUSE AT 93D STREET AND CENTRAL PARK WEST, NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

SKETCH FOR AN APARTMENT HOUSE.
ALBERT JOSEPH BODKER, ARCHITECT.

SKETCH FOR AN APARTMENT HOUSE INTERIOR.
ALBERT JOSEPH RODKER, ARCHITECT.



SKETCH FOR AN APARTMENT HOUSE INTERIOR.
ALBERT JOSEPH BODKER, ARCHITECT.

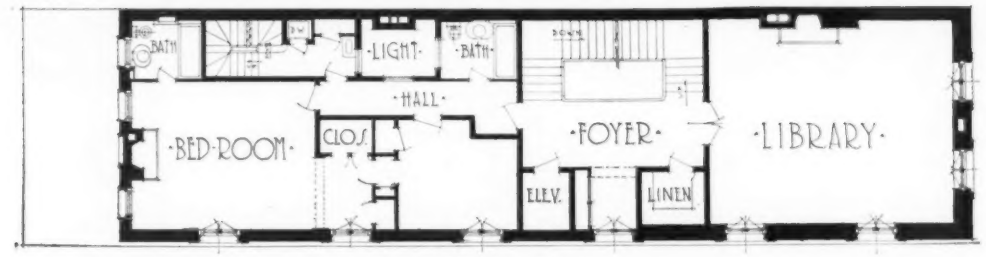


TYPICAL FLOOR PLAN, APARTMENT HOUSE AT 383-387 PARK AVENUE, NEW YORK CITY.
Albert Joseph Bodker, Architect.

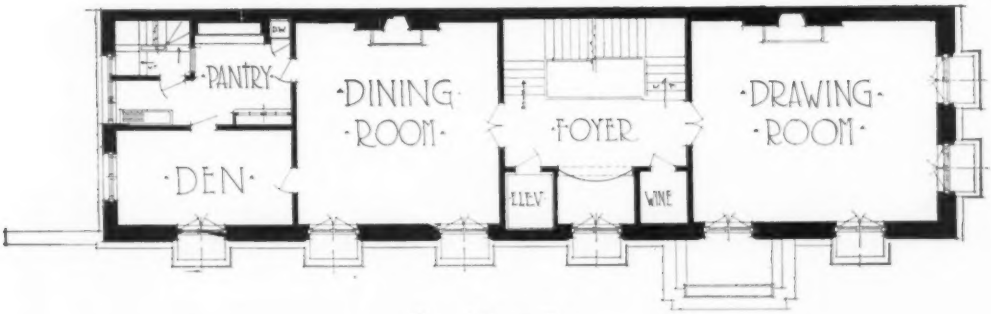
elimination (for reasons of initial cost) of many essential features of the architect's original drawing, yet this is only one of the restrictions which must be met as cleverly as possible. When it becomes generally recognized by owners and building syndicates that every dollar expended in architectural excellence can be reaped many-fold in higher yearly rentals, we may expect to see even a better type of apartment house than has recently been developed.

The development in the last decade has been amazing, and under conditions where architects are given even greater latitude than today it is difficult to predict the exact attainment in the apartment house of the future, considered either as a monument of practical details or of architectural ideals.

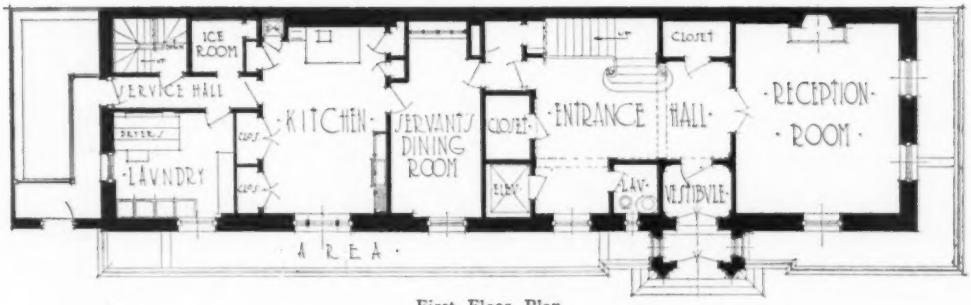
Critically consider the general aspect of the residence of Robert Chesebrough, in New York City. There is no architectural nonsense about a building of this sort. It is severe enough to escape any danger of appearing frivolous, yet human enough not to be austere. It is a piece of design wherein is not to be seen the hand of the fanatical classicist (who would design a Doric garage), the frenzied "Beaux-Artist," who prepares *a-la-carte* detail on the order of the creations of a French *chef*, nor yet any of the fantastic originalia of the innovator, who thinks, when pressed, that Sir Christopher Wren was very well *as*



Third Floor Plan.



Second Floor Plan.



First Floor Plan.

PLANS OF THE RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ.
Albert Joseph Bodker, Architect.

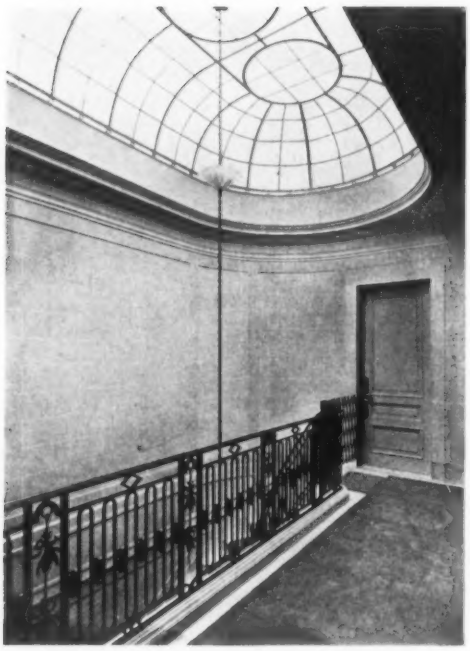
far as he went. It is a sane expression of design aptly applied to its intended use, on a building sufficiently but not over-decorated. It is a house with a fit proportion of architectural embellishment—not a mass of decoration, piled block on block, console on cartouche, forming a general exemplar of design in which, perhaps, human beings live.

More manner and less mannerism would leaven the architecture of this country amazingly and place it on an ascending plane travelling toward really significant achievement as the ultimate goal.

One cannot feel, in the Chesebrough house, that the architect was aping the Italian Renaissance, for there is much in the composition which is not Italian Renaissance. Yet there is apparent that quality of dignity and a certain urbanity more essential than anything else in the city house, and a pleasant absence of broken pediments, over-fed cartouches and meaningless effigies of green-groceries in stone.

In point of composition, the location of the entrance obviously tends to throw the long façade out of balance, but the narrow city lot is only one of the prob-

RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., 870 PARK AVENUE, NEW YORK CITY. ALBERT JOSEPH BODKER, ARCHITECT.



STAIR HALL OF ATTIC FLOOR, RESIDENCE OF OAKLEIGH THORNE, ESQ.
Albert Joseph Bodker, Architect.

lems of the city house. And it was required to give the room to the right, the reception room, the full width, with two windows. The entrance vestibule is flanked left and right by the elevator and a large closet, and gives, to the right into the reception room.

The Georgian treatment of the entrance hall is better in itself than in relation to the exterior character of the building, and a fit and pleasing transition to the quietly dignified Georgian drawing room. On the first floor are also the kitchen, the servants' dining room, the laundry, ice-room and other utilitarian accessories.

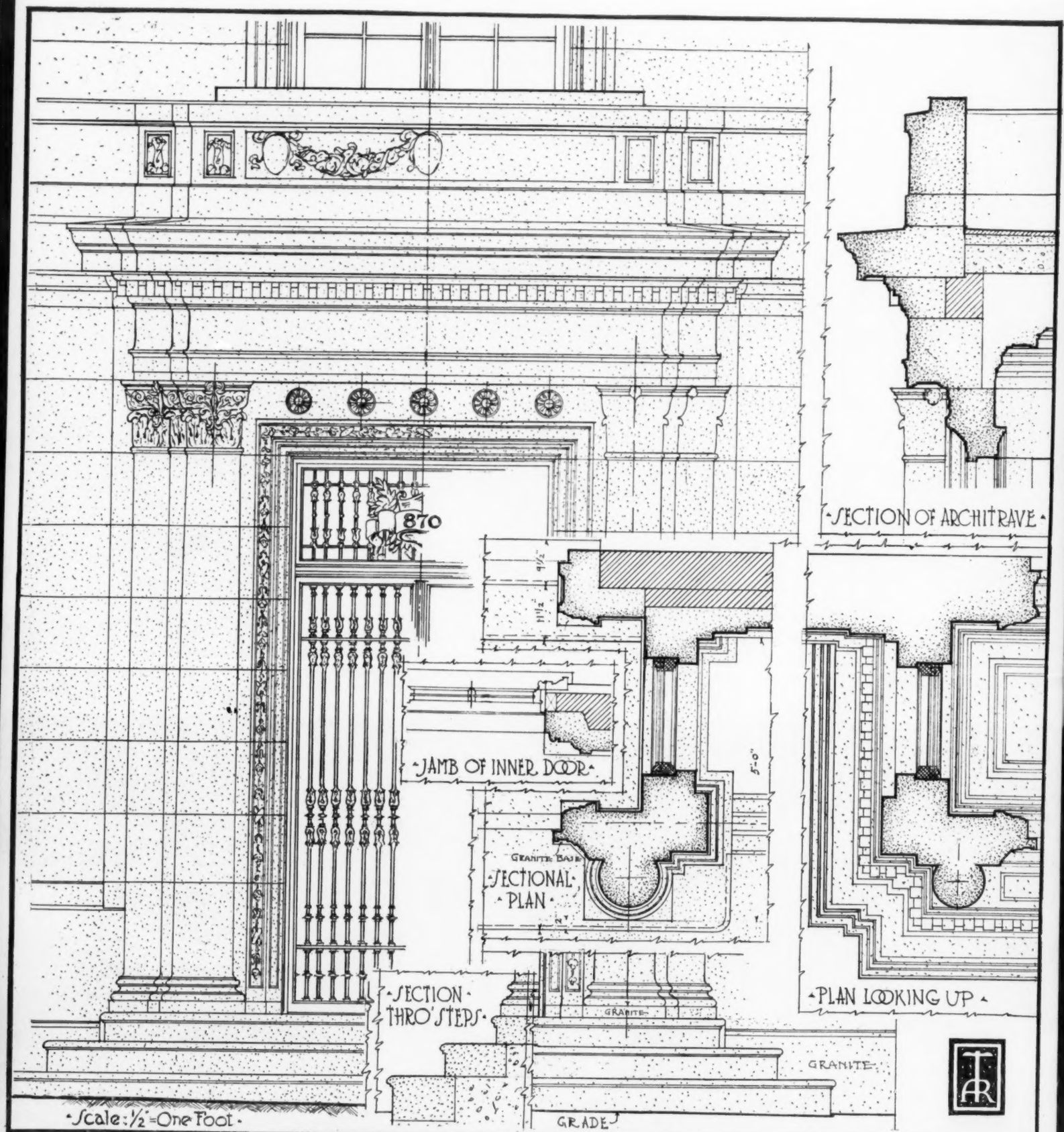
The second floor, the *premier étage* of the French house, is occupied by the foyer, over the entrance below, with the Georgian drawing room to the right, and running the entire width of the lot. To the left, the dining room, with a door to a "den" and to the pantry, which rooms divide the width of the building. The library, with two bed-rooms and a large bath, with sundry closets, make up the third-floor lay-out. The remaining two floors contain other bed-rooms and the accommodation for servants, though the plan for this house is not, in many respects, so interesting as that of the Oakleigh Thorne residence.

The recently completed residence for Oakleigh Thorne, Esq., in New York City, is an interesting fabric wherein old and new are woven together with an artful artlessness productive of a peculiarly interesting result. It is essential to state at the outset that the architect's problem here was three-fold—to devise a dignified and pleasing exterior, a practical and an esthetic interior, and to accommodate the plan to certain complete rooms which were brought over in their entirety from France. The panelling of one of these rooms called for windows of a certain distance apart, which, as can readily be guessed, formed a compulsory governing factor in the fenestration of the entire 73d street façade. A study of the appearance and arrangement of what is certainly an absolutely unique house, is a study no less interesting for the architect than for the decorator, nor less interesting to either than to a connoisseur of old and veritable French *"boiseries."*

AN EARLY SKETCH (1910) FOR THE OAKLEIGH THORNE HOUSE, SHOWING "SGRAFFITO" DECORATIONS.
Albert Joseph Bodker, Architect.

THE STAIR HALL, RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

ENTRANCE DETAIL OF RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.



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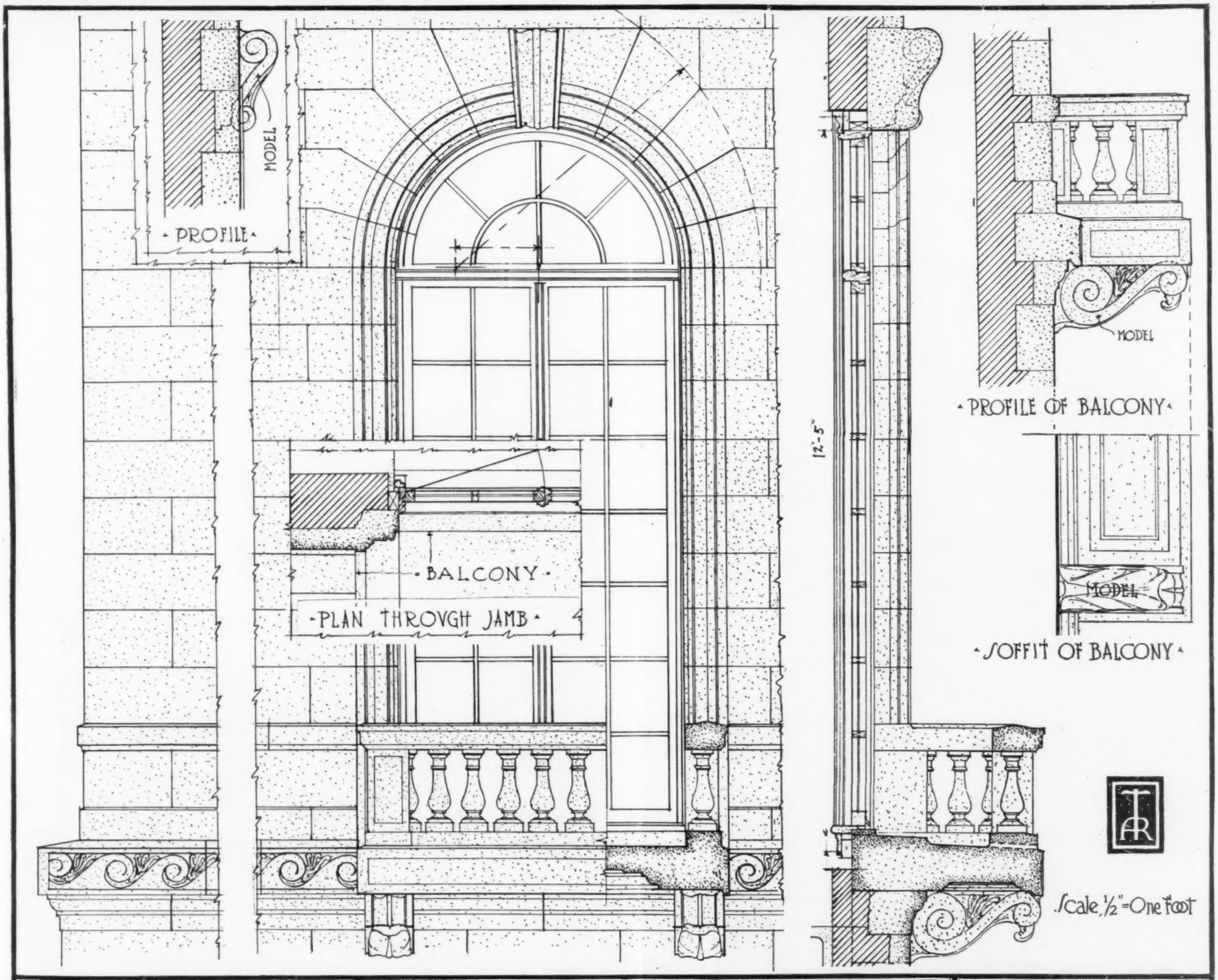
DETAIL PLATE No 1
ISSUE OF MAY 1913

DETAILS OF ENTRANCE: RESIDENCE OF ROBERT A. CHESEBOROUGH, ESQ., NEW YORK CITY

ALBERT JOSEPH BODKER,
ARCHITECT



ARCHITECTURAL RECORD DETAIL PLATE N°2
ISSUE OF MAY 1913

DETAILS OF SECOND STORY WINDOW, ETC.

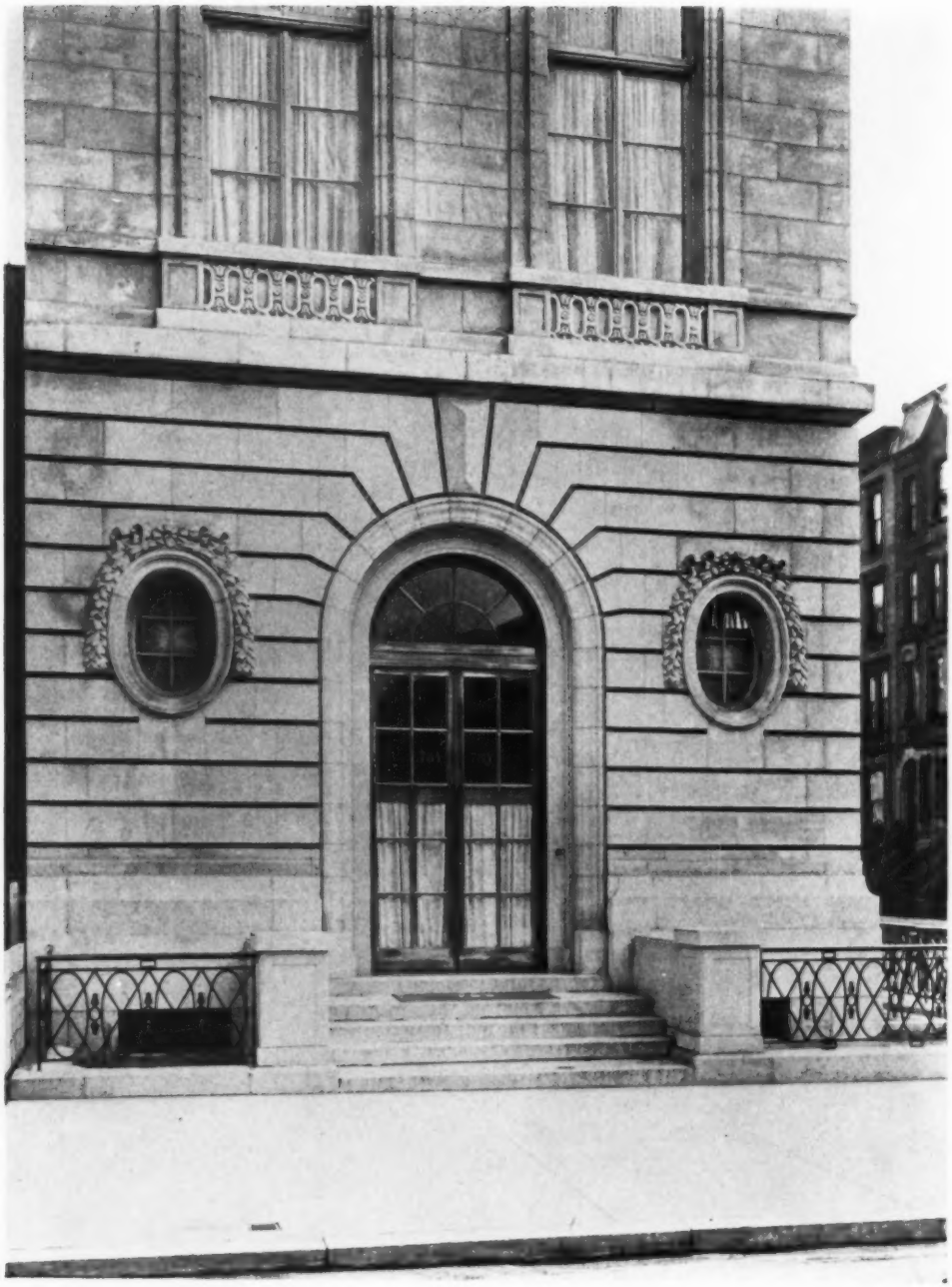
RESIDENCE OF ROBERT A. CHESEBOROUGH, ESQ.

ALBERT JOSEPH BODKER,
ARCHITECT

THE DINING ROOM, RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

THE DINING ROOM, RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

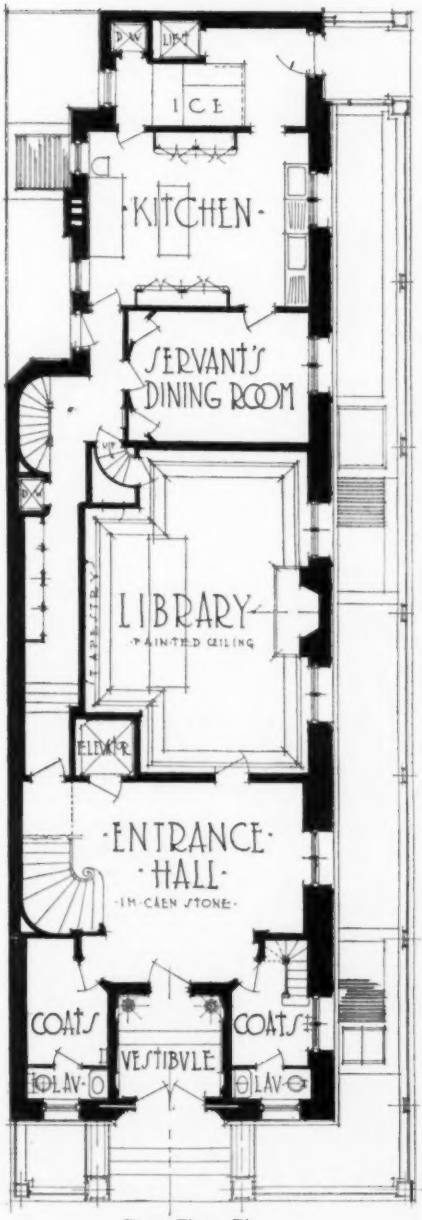
THE DRAWING ROOM, RESIDENCE OF ROBERT A. CHESEBROUGH, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.



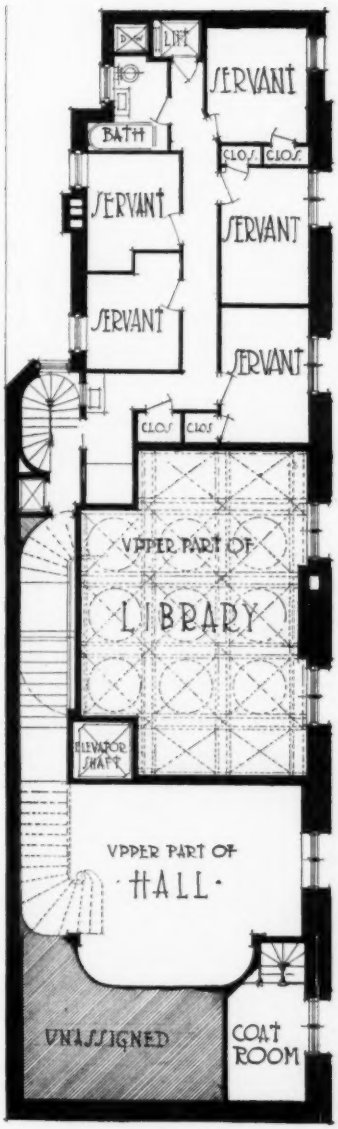
ENTRANCE DETAIL OF THE RESIDENCE OF
OAKLEIGH THORNE, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

RESIDENCE OF OAKLEIGH THORNE, ESQ.,
783 PARK AVENUE, NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

ENTRANCE HALL, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.

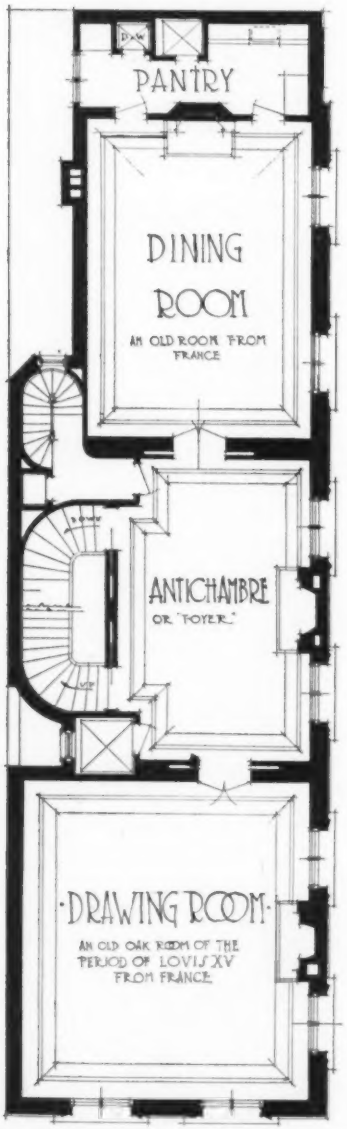


First Floor Plan.



Mezzanine Floor Plan.
(Between 1st and 2d Floors.)

PLANS OF THE RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY. ALBERT JOSEPH BODKER, ARCHITECT.



SECOND FLOOR PLAN, RESIDENCE OF OAKLEIGH THORNE, ESQ.
Albert Joseph Bodker, Architect.

The exterior presents no features which could be considered sensational—and here as a preliminary note is a quiet conformity with the character of the house itself. The original scheme under consideration was for a much larger house, in the style of the Italian Renaissance, with tile roof and with decorations in "sgraffito." The acquisition by Mrs. Thorne of some very remarkable old French rooms obviously caused a change to the style of the French Renaissance—that urbane and architecturally dignified style that is best expressed, perhaps, by the character of Little Trianon. And here, to imprint that definite character upon the building unmistakably, the windows of the second story—the French *premier étage*—are detailed in close adaptation of the Little Trianon windows. Another detail, one so characteristic of the period as to be almost a symbol, is the oval window with a garland above it, simply, but effectively, introduced in the entrance front. There is little to be said about the exterior, and therein, if the truth were known, lies its merit. The best period of the French Renaissance was successful and pleasing in exact proportion to its restraint and repression—not to its profusion or elaboration.

Passing through an almost severe vestibule, treated as caen-stone, and decorated only by two marble wings, this vestibule gives into a lofty entrance hall, also with the caen-stone treatment, and with a tessellated marble floor and artfully wrought iron stair rail. Old carved wooden doors, among the other architectural treasures brought from France, give an intimation of revelations to come. To the left, the elevator door, and to the right, a vista of the library presents itself. In the entrance hall there are two deftly disposed coat rooms, equipped with all the minor luxuries of similar rooms in our up-to-date hotels—a recent innovation in the accommodations of the city house.

The library is a cool-toned room with plain walls in a cold yet rich blue, entirely relieved on the north wall by an enormous and unusually beautiful tapestry. The doorway through which this library is entered from the hall is a beautifully carved, painted and gilded replica done by Salvatori—a marvellously skilled artist-craftsman of Florence. From the same hand came the ceiling of this room, artfully painted on ancient wood, and in a combination

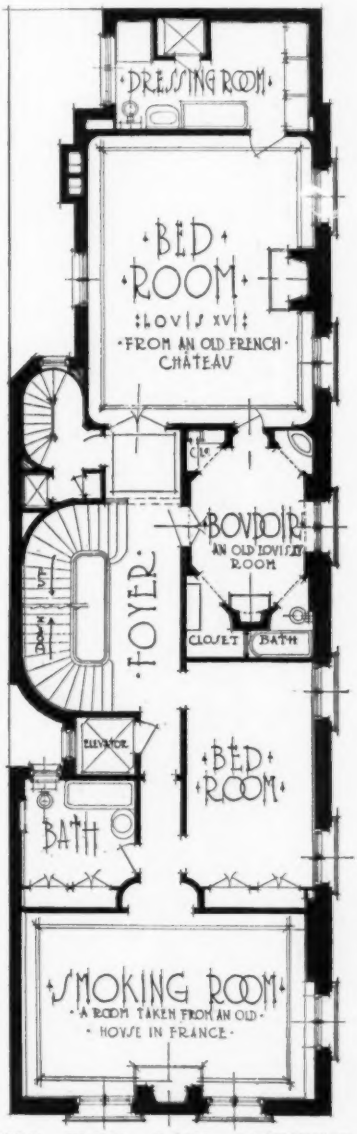
of colors and tones and dull gilt so rich, so subdued and so harmonious as to defy the faintest supposition that there is any particle of modernity in the work whatsoever. Salvatori, indeed must have some lingering trace of that inimitable art of the great Italian Renaissance. I do not think, indeed, that this ceiling is an imitation, but rather a reincarnation of one that might have been in Italy in the 14th century.

Examination of the remainder of the plan of the entrance floor will show that the space from the east wall of the library to the back of the building is compactly occupied by the servants' hall, the kitchen and a domestic office, which an English architect would probably call the "scullery." Here is accommodation for ice and for receiving other supplies, and a goods lift and dumb-waiter assure ample and swift communication between this very important domain and the rest of the house.

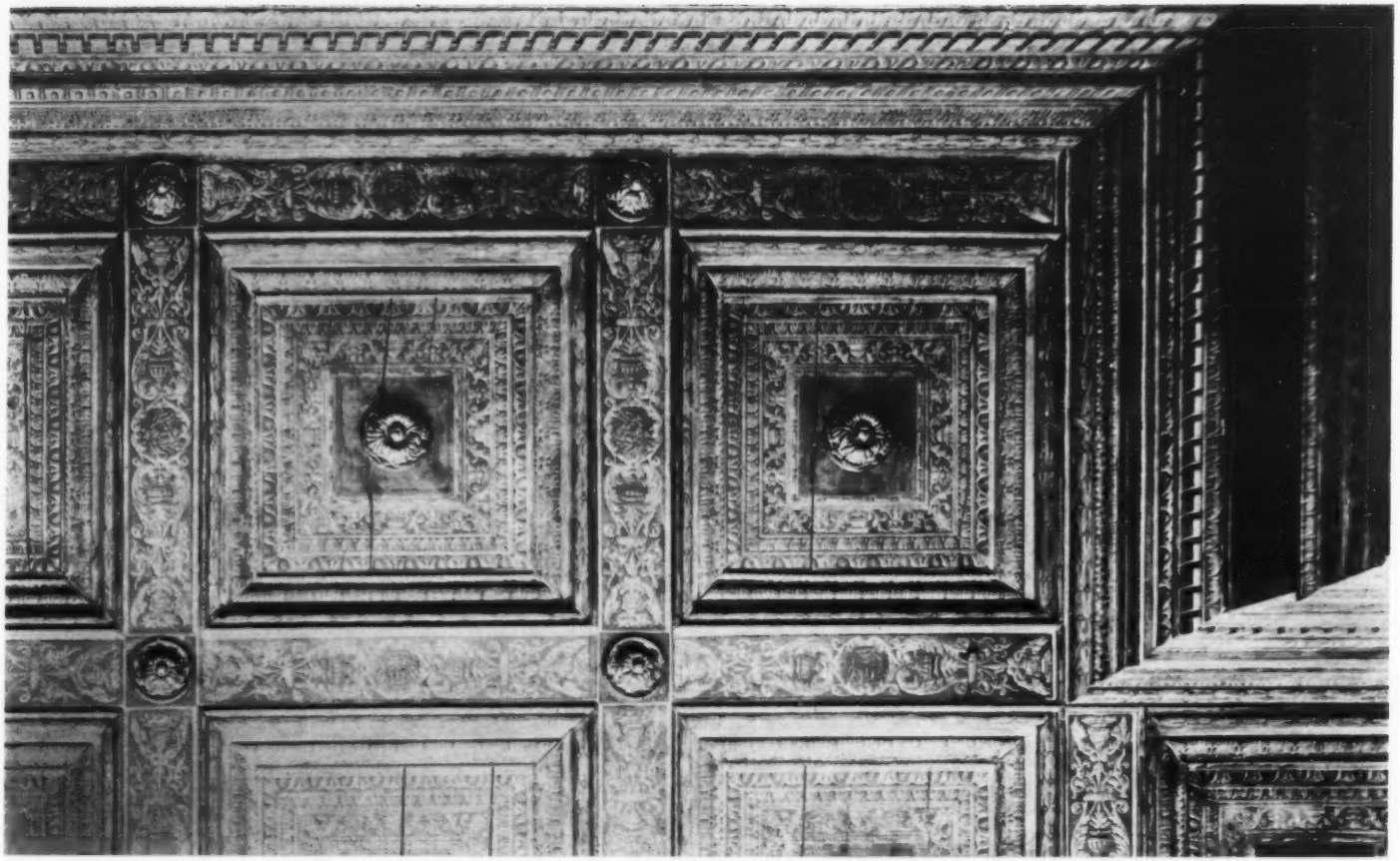
The additional height of the entrance hall and the library is taken up as shown on the second plan (illustrated on page 403) by a very convenient mezzanine floor in the rear, easily accommodating rooms for five servants and a bath, as well as sundry closets, a porcelain closet for fresh flowers and a sink, etc., for the daily disposal of these in vases throughout the house.

It might he mentioned with considerable emphasis that the private self-operative elevator has more or less revolutionized the planning of the city house. To be sure, it is one more mechanical detail to reckon with and after the several stair-landings are taken care of, the elevator doors must be considered—but, on the other hand it makes possible the introduction of the aforementioned useful mezzanine. One steps into the elevator at the entrance floor, from the hall and alights at the second floor, having unconsciously run by the mezzanine floor, of which the very existence would remain unknown and unsuspected if the hostess were not giving a complete "tour of inspection."

Alighting, then, at the second floor, access is had to one of the most interesting of the interiors. It is the work of a remarkable French artist-connoisseur, Alcine d'Albret, and is fashioned with infinite care for conformity with the dining-room, which is an example of veritable "period," and which is reached through the doorway at the east end. In this country we are prone

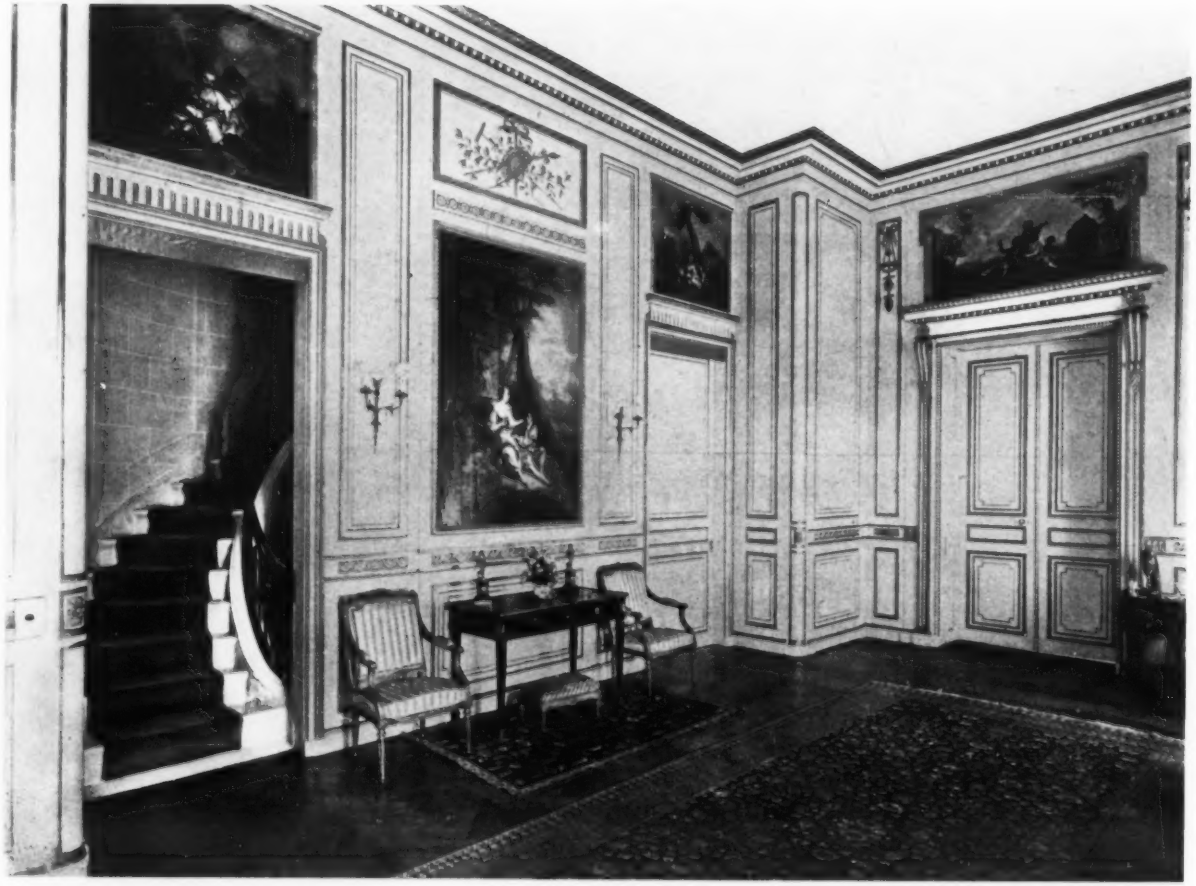


THIRD FLOOR PLAN, RESIDENCE OF OAKLEIGH THORNE, ESQ.
Albert Joseph Bodker, Architect.

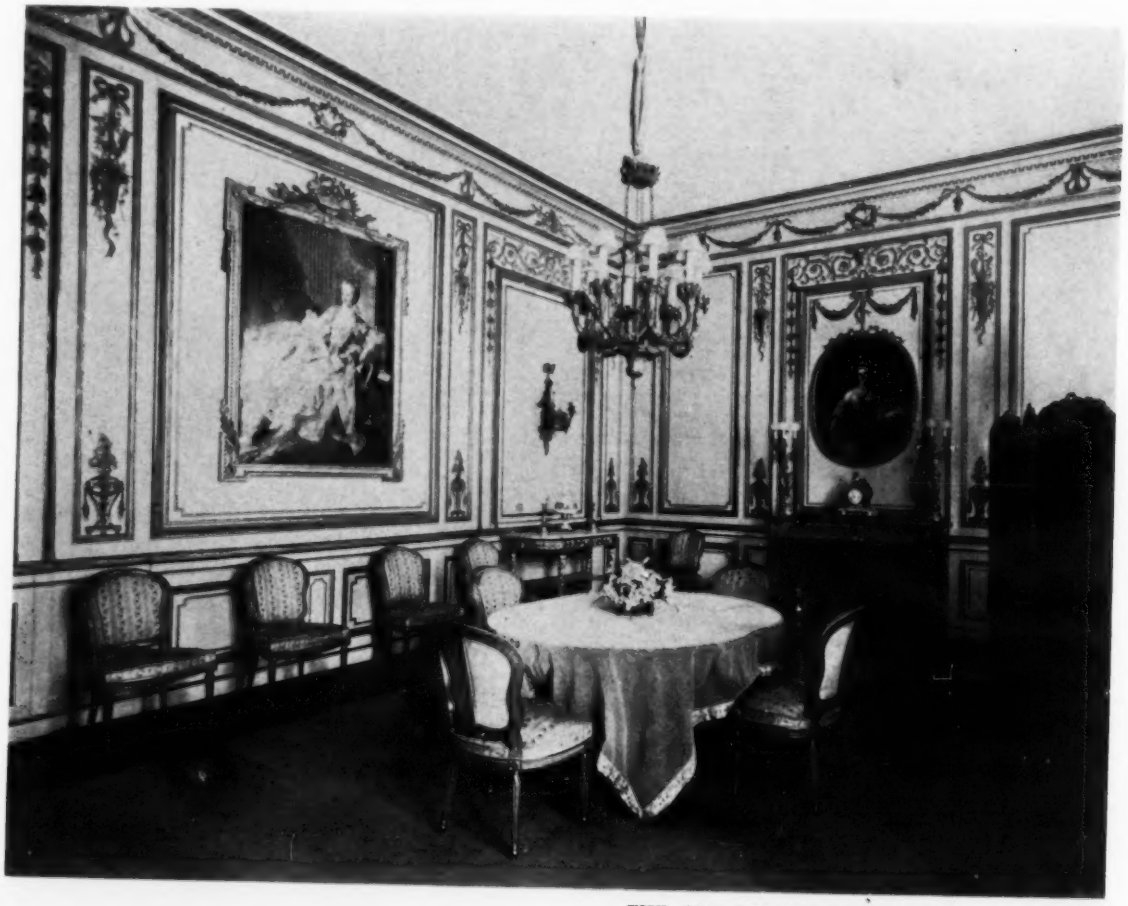


DETAIL OF THE LIBRARY CEILING, RESIDENCE
OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

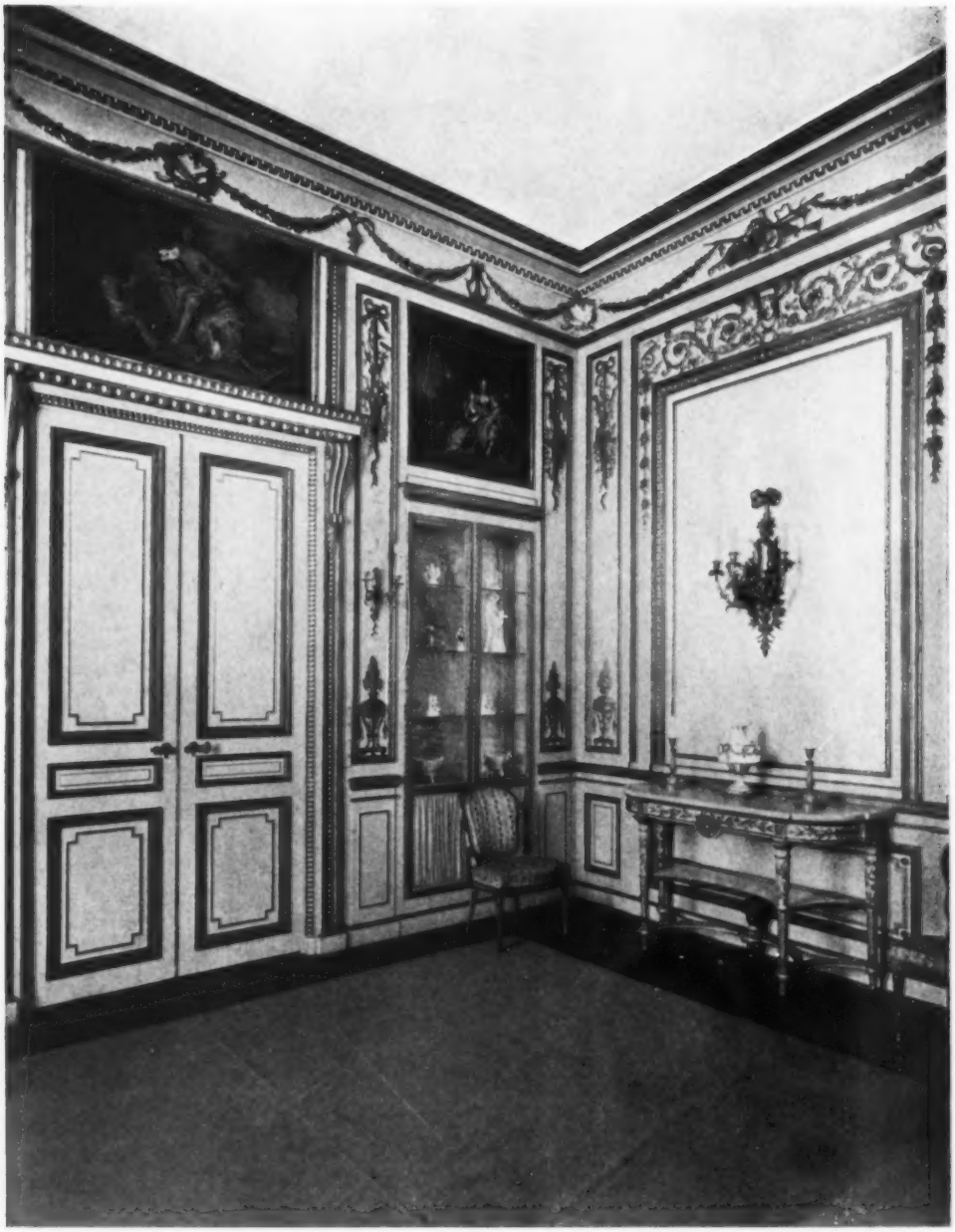
THE LIBRARY, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.



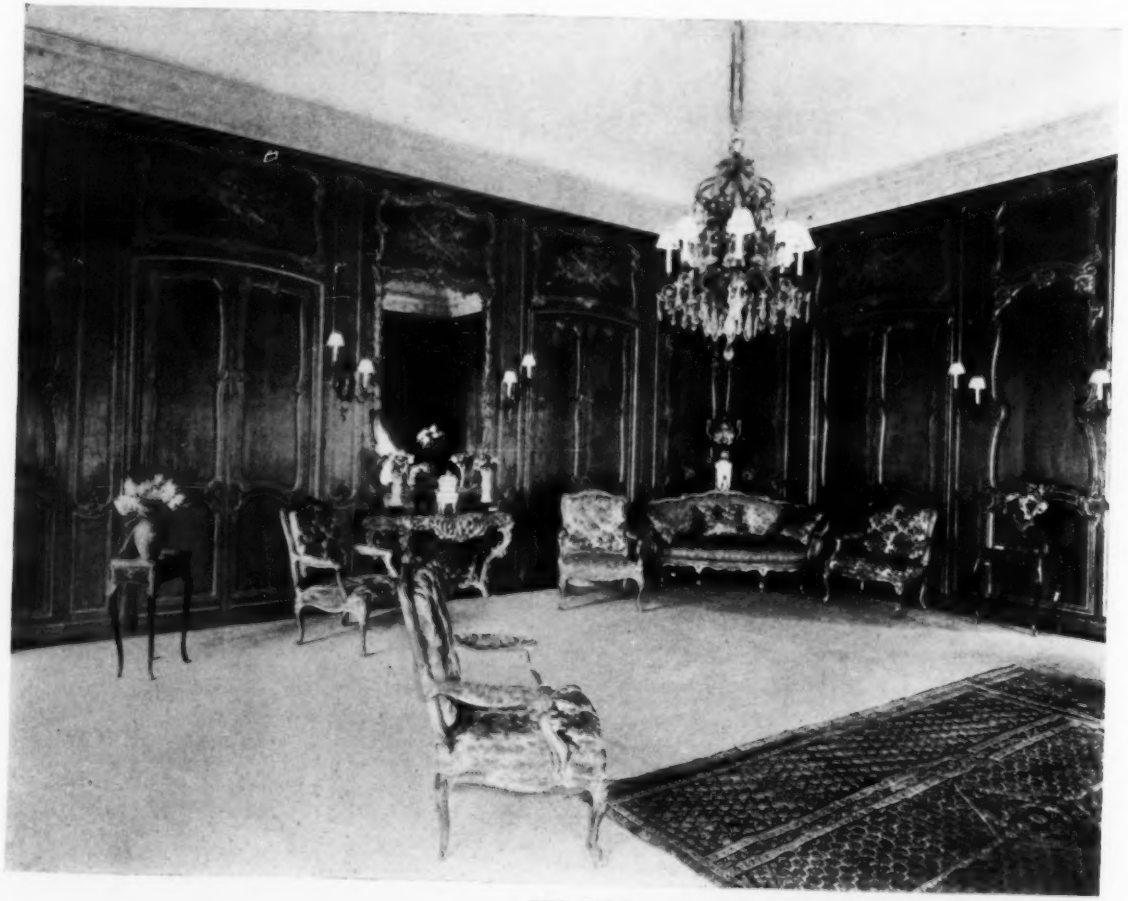
THE "ANTECHAMBRE," OR SECOND FLOOR FOYER, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.



THE OLD FRENCH DINING ROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

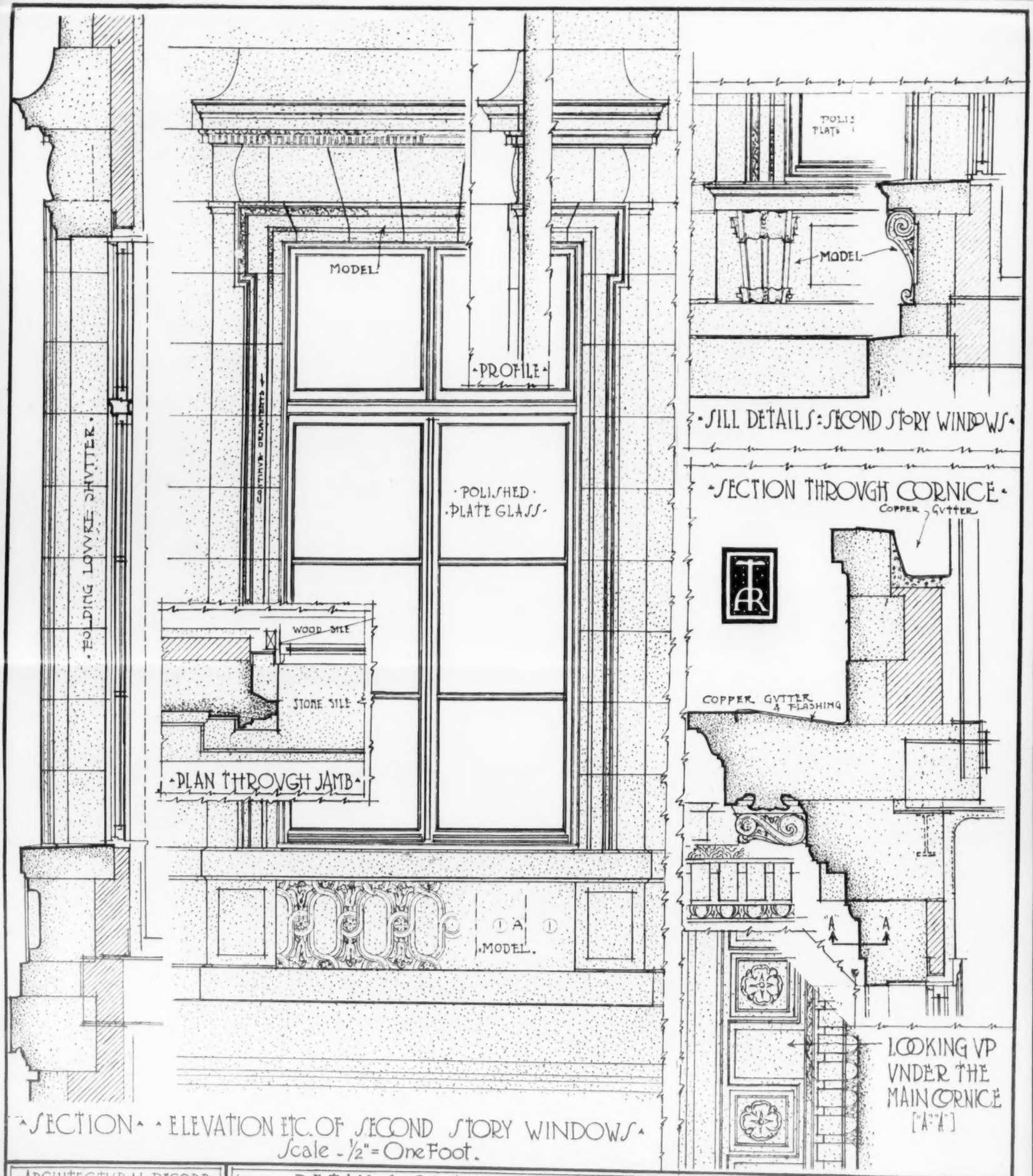


DETAIL OF OLD FRENCH DINING ROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.



THE SALON, AN OLD FRENCH ROOM (LOUIS XV), RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

PERSPECTIVE OF 73D STREET FACADE, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.
ALBERT JOSEPH BODKER, ARCHITECT.


FOLDING LOUVRE SHUTTER.
MODEL
CAST IRON GUARDS
PROFILE
POLISHED PLATE GLASS
WOOD SILL
STONE SILL
PLAN THROUGH JAMB
A
MODEL.
POLISH PLATE
MODEL
SILL DETAILS: SECOND STORY WINDOWS
SECTION THROUGH CORNICE
COPPER GUTTER
COPPER GUTTER & FLASHING
A
A
LOOKING UP UNDER THE MAIN CORNICE ["A"-"A"]
SECTION & ELEVATION ETC. OF SECOND STORY WINDOWS
Scale - ½" = One Foot.
ARCHITECTURAL RECORD
DETAILS OF THE DECORATION

SECTION · ELEVATION ETC. OF SECOND STORY WINDOWS ·
Scale - ½" = One Foot.

ARCHITECTURAL RECORD
DETAIL PLATE № 3.
ISSUE OF MAY, 1913.

DETAILS OF THE RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY

ALBERT JOSEPH BODKER,
ARCHITECT

THE SMOKING ROOM, WITH OLD WOODWORK AND TAPESTRIES (LOUIS XV), RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

DETAIL OF OLD FRENCH BEDROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

DETAIL OF OLD FRENCH BEDROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ., NEW YORK CITY.

A BEDROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ.
Albert Joseph Bodker, Architect.

to blithely designate the second floor "*antichambre*" as a "foyer"—and though this designation would offer an insoluble puzzle to a Frenchman, it is, perhaps, the most expressive and understandable word for the United States. This is for the reason that not only it is the connecting apartment between the old dining-room and another remarkable old room, the salon, at the front of the house, but because the stairs, up and down, give into it, as well as the concealed elevator door.

An interesting structural precaution, and one which was skillfully and effectively carried out is the introduction of concealed, sliding fireproof doors in all the openings. In the illustration of the "second floor foyer" the sliding door protecting the opening of the ascending flight of stairs is shown wide open and the fire door of the descending flight, balancing it, is closed.

The skill with which the panelling of this exquisite *antichambre* is conceived and executed must be seen to be appreciated—the nice alignment of parts, the restraint of the detail and the everpresent perfection of scale, qualities more characteristic of the latter work of the period of Louis XIV and of certain phases of that of Louis XVI than of any work of the Louis XV period—the living spirit of a past decorative epoch masterfully seized and consummately rendered by Alcine d'Albret. It is necessary that one know every moulding as surely as one knows the letters of the alphabet to produce a work such as this. It is not, as I have said before, a question of imitation, but of re-incarnation. One cannot copy a period and achieve such a result—he must relieve it and make his mind, at least, a part of it.

The only colors other than those in the paintings (which, by the way, are introduced in remarkable conformity with the period) are white, slightly "aged" and dull, yet rich gold. This very simple, but very effective decorative scheme, is an echo of the dining room, which makes M. d'Albret's artifice in the "*antichambre*" the more marvellous by reason of the perfect similarity of the two rooms in character and spirit. Again, in this room, as in the outer room, which was inspired by it, there is the same nicety in the alignment of members and parts, the same restraint of detail and the same absolutely faultless accuracy in scale. This old room was originally made, it is said, for a Cardinal, and was painstakingly restored by M. d'Albret in a manner impossible of achievement by anyone not possessing his unique knowledge of old "*boiseries*" or his inspired love for their most infinitesimal niceties of detail. The studious attention which he would devote to one moulding, his consideration of it and his comparison of it with others, in short his conscientiousness, is a silently accusing arraignment of a good deal of slap-dash guess-work in this country.

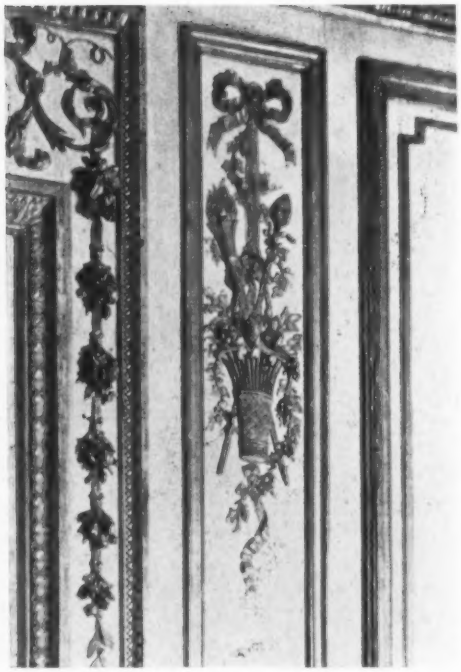
Further perfection has been given to this already amazingly perfect dining-room by the care exercised in the scale of such accessories as the chairs, the

THE BOUDOIR—AN OLD FRENCH ROOM OF THE PERIOD OF LOUIS XV—RESIDENCE OF OAKLEIGH THORNE, ESQ.

Albert Joseph Bodker, Architect.

console tables, the chandelier and ornaments on the mantel-piece, as well as the mantel-piece itself and the wall sconces over it. It is a French room, essentially, but it is one which has made itself so quietly at home in this country as to go on record as a proof that the exquisite phase of French architecture which it represents is so gracious and urbane as to be veritably "*cosmopolite*." Incidentally, it was the panelling between the two windows of this beautiful room, which governed the fenestration of the entire long façade of the house. Not one millimeter of difference, this way or that, would M. d'Albret allow in the trans-Atlantic installation of a so-precious "*vrai antique*" as this dining-room. It was with a certain quiet misgiving that he learned of Mrs. Thorne's intended exportation of this, and other works from France, and his peace of mind returned only upon her suggestion that it was a fine thing, *magnifique, splendide,* that these beautiful interiors might come as an inspiration (as indeed they do) to Americans, both lay and professional.

Leaving the dining-room and traversing the "antechambre," there is, at its west end, a door corresponding to the dining-room door and giving into a great salon. Here is a room which even the chronic defamer of the decorative style of the "period of Louis XV" must concede to be beautiful. The wood is dark oak, the only application is dull gilt on certain mouldings, and on the "musical attributes" in the over-panels —attributes suggesting that long ago this exquisite salon was a music room. A small book might be written in analysis of this room—of the grace-notes and variations in the panelling, for it is a



DETAILS OF CARVED WOODWORK IN THE DINING ROOM, RESIDENCE OF OAKLEIGH THORNE, ESQ.

fascinating room and (what is remarkably rare) a really perfect example, and a pure example of the best phase of the decorative work of the period of Louis XV. If it does not surpass the examples in the recently arranged wing of "decorative arts" in the Metropolitan Museum, it fully equals them.

On the third floor, at the front of the house, is the smoking-room, interestingly fashioned from beautifully carved old French woodwork, of the period of Louis XV, and decorated with tapestries of the same period. Interesting as these are they seem a little out of scale with the room, and seem, as well, a little rigid and flexible by reason of being stretched tight instead of hanging loose.

In addition to this room, and separated from it by a bedroom and bath, there is another beautifully carved room brought over from France, a bedroom giving into a small octagonal boudoir in oak. The wood carving in the bedroom, as well as in the boudoir, is marvellous in this day of short-cuts to the same effect by means of various plastic compositions. In each corner of the bed-room, the corners are gracefully rounded and are decorated with delicately modelled "attributes" of the four seasons. This room is believed to have come originally from an old French country house and though the painted lunettes over the two doors on the east wall were not originally a part of this room, they are in beautiful conformity with it.

The fourth floor is occupied by the housekeeper's bed-room and sitting-room, other bed-rooms and a maid's room, baths, closets, etc., and the attic floor with more servants' quarters, a large cedar closet, the house tank, trunk-room, etc., etc.—the whole making a compact dwelling which presents not only accommodations for the practical needs of a household run on thoroughly efficient basis, but which presents, as well, unique decorative values. There have been many copies and imitations, good, bad and indifferent, of French "period" interiors, but here are the actual rooms, skillfully installed in

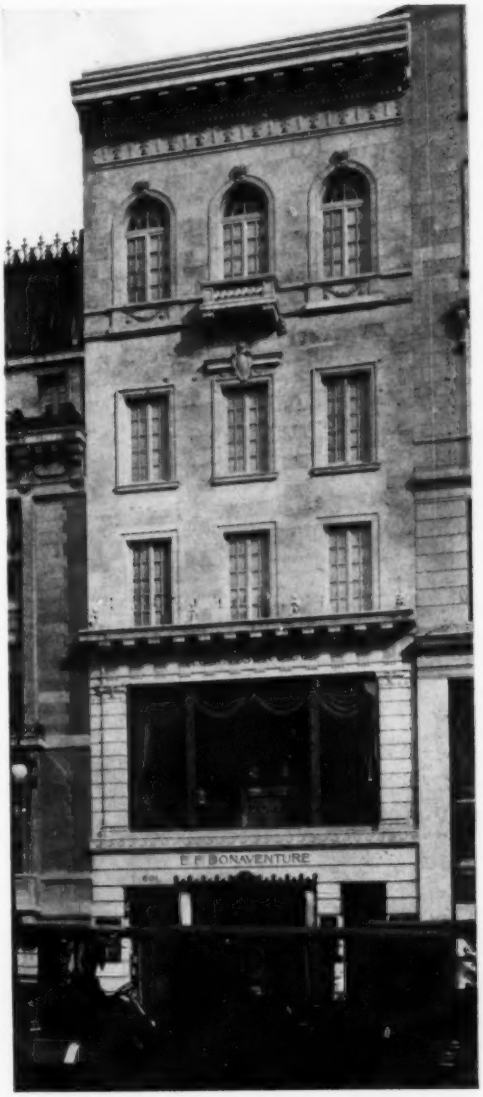
a modern New York City dwelling. Certainly this is not "American Architecture," but it is an evidence that a connoisseur possesses not only keen architectural appreciation, but also a desire that such perfection as was attained in France may serve as a model and incentive in this country.

That the appearance of a country house is incalculably enhanced by well-grown planting could not be more graphically evidenced than in the Herbert A. Wheeler, Esq., residence at Hartsdale, N. Y. Here is a rendering of the "picturesque" suggestive of some work by other residential architects, but indicative of a cursive personal freedom. Owing to the placement of the chimney the front elevation seems more pleasing than the garden elevation.

The spacious living room of this house, surprisingly large for a dwelling of the size, is illustrative of the soundness of an excellent theory, often propounded but rarely followed—that a few large rooms are infinitely to be preferred to a labyrinth of small ones, with good floor space wasted by useless passages, and cut up by narrow doorways.

While Mr. Bodker is not one of those architects whose forte is versatility, it seems evident that he possesses an architectural instinct in the design of that refined type of semi-commercial architecture which has recently come into being in New York, as is evidenced by his façade at 601 Fifth Avenue.

In conclusion it may be fitting to state that the measure of an architect's work may not aways be had from what he has done, but often from what he has not done, and although this might be reckoned as a rather vague, if not an actually negative, criticism of Mr. Bodken's work, perhaps it is more apt than any other. In the Chesborough and Thorne houses, from the point of view of their exterior aspects, the architect has not tried to impress the passer-by with how many architectural details he knew. For this there is much to be thankful, for it is well to design with the thought that one is designing one building at a time. After all, this is a quality no more subtle than common discrimination, which, coupled with a certain amount of fundamental architectural knowledge, a certain amount of taste and a good deal of restraint will go far toward the development of a distinctive type of design in this country.



COMMERCIAL BUILDING AT 601 FIFTH AVENUE, NEW YORK CITY.
Albert Joseph Bodker, Architect.

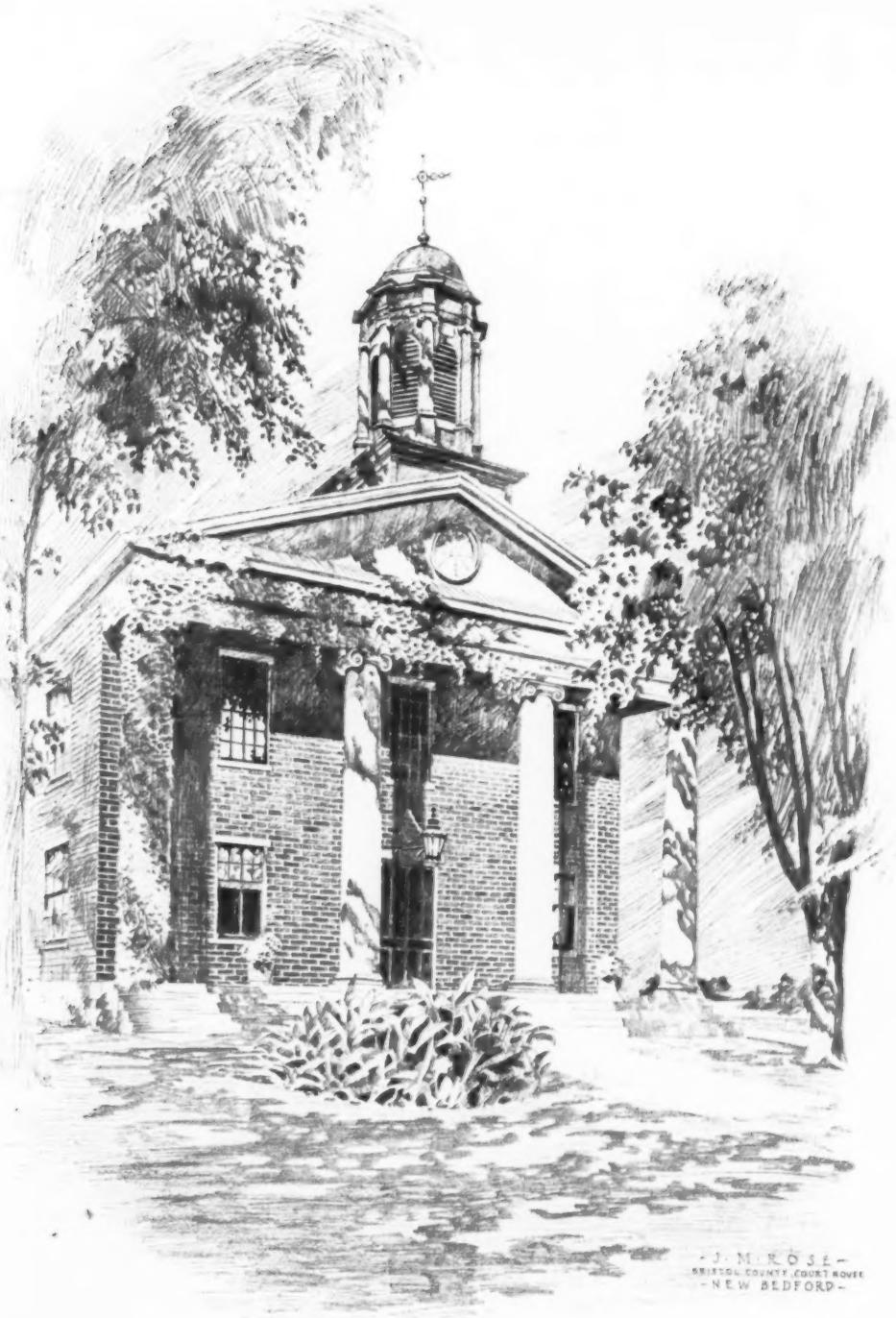
RESIDENCE OF HERBERT A. WHEELER, ESQ., HARTSDALE, N. Y.
Albert Joseph Bodker, Architect.

THE DINING ROOM, RESIDENCE OF HERBERT A. WHEELER, ESQ., HARTSDALE, N. Y.
Albert Joseph Bodker, Architect.

RESIDENCE OF HERBERT A. WHEELER, ESQ., HARTSDALE, N. Y.
ALBERT JOSEPH BODKER, ARCHITECT.

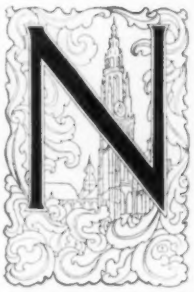
LIVING ROOM, RESIDENCE OF HERBERT A. WHEELER, ESQ., HARTSDALE, N. Y.
ALBERT JOSEPH BODKER, ARCHITECT.

LIVING ROOM, RESIDENCE OF HERBERT A. WHEELER, ESQ., HARTSDALE, N. Y. ALBERT JOSEPH BODKER, ARCHITECT.


-J. M. ROSE-
BRISTOL COUNTY COURT HOUSE
-NEW BEDFORD-

THE PAST CENTURY CHARM of NEW BEDFORD

BY GRACE NORTON ROSÉ
PENCIL DRAWINGS
BY JACK MANLEY ROSÉ



Not alone do the old gray wharves and stone warehouses tell of New Bedford's interesting past. If you climb up the narrow cobbled streets that lead steeply through the business section to the elm-arched crossroads beyond, you will find quaint old houses with tiny walled gardens, and tall-pillared residences set back in their spacious grounds; that speak eloquently of the best the past century had to offer.

Bedford village in Dartmouth, was founded by Joseph Rotch of Nantucket in 1765, some years after Massachusetts Bay Colony bought and settled Dartmouth at the town of Oxford across the river. There are a few architectural remains of this, the first settlement, and at the Head-of-the-River an old Meeting House with its two stone chimneys and two old fire places, several rough houses of the first settlers, and a stone bridge of Revolutionary fame, still stand. Here, too, can be found the location of Russell's garrison, where the Colonists fled for refuge during King Philip's war. In fact these townships abound with relics of our country's earliest days, but the charm of New Bedford itself centers about the architecture of a later period.

The little city has suffered so much in the past: first at the hands of the Indians, and later from the British under Major Gray. Fire, pillage, and commercial progress have done their best to obliterate all traces of Colonial days and the times of the Union's infancy; but fair and truthfully stand the milestones of the city's growth from the Revolutionary period to the zenith of its prosperity and success. The sturdy wharves, the great warehouses, ship lofts, rope walks, and candle works, all proclaim this. Virtually gone now is the busy shipping trade; the outgoing whalers fitting for cruises and unloading their catches of oil and bone. Now and then, a whaler of the old type lies along the wharf after a desultory year's cruise, or quietly refits for a last few journeys in the pursuit of the whale—but no longer do the townspeople crowd the water front in welcome or farewell. No longer is the talk of the ships that sail in the morning. Pride and competition in the trim and gallant appearance of the craft has departed. The old hulks crawl out almost unnoticed, poorly manned by foreigners, begrimed and shabby, to return without acclaim, dirtier still. Gone is the romance and the allure of the olden days. The foreign trade has practically ceased. Busy cotton mills are bringing new prosperity to New Bedford. A prosperity of the few and an influx of ignorant imported labor that even today has set its tawdry finger marks upon the beautiful city.

Trade, commercial activity, and the increase in population through immigration, sweeps the business center slowly but surely upward from the water front: and quaint little houses of one hundred and fifty years ago have been remodeled into shops or razed to make room for more pretentious structures. Here and there a one-time Quaker home is left, empty and forlorn, huddled between ugly brick stores, only a tiny garden remaining of all its fields and orchards. But, gratefully, a block beyond and the shaded quiet streets

A SUBSTANTIAL OLD HOUSE IN NEW BEDFORD, TYPICAL OF THE QUIET SEVERITY OF NEW ENGLAND ARCHITECTURE.
From the Pencil Drawing by J. M. Rosé.

show unbroken ranks of old frame houses, each with its own walled or high-fenced garden. Fine old doorways, their chief ornamentation, are found on these simple homes. Some owe their charm chiefly to their good workmanship, their plain honesty of proportion, and the flickering tree shadows that fall across them. Their well kept yards and masses of old fashioned shrubbery add not a little to their attraction. Here and there one finds a really old house, still delightfully habtable. Its massive construction, and the care lavished upon it through the generations have kept it in its present state of soundness. A little flagged path leads up to its tidy doorstep, and a clump of old box adorns each side of the tiny porch.

At every street corner, looking down the cobbled hill, one glimpses the blue stream and the masts that crowd it. Several well proportioned steeples, a glass cupola, or a captain's walk edge in among the roofs. Near the water front stands the Custom House, like the old warehouses, several public buildings, and many of the fine churches and residences, constructed of native gneiss. It has the prevailing Colonial feeling of architecture and its self sustaining flight of inside stone stairs, built by a local mason, are declared worth while investigating. Down in this section are several old candle works and ship lofts of remarkable stone construction and beauty. The Mariner's Home on Johnny Cake Hill was once a fine private residence, when that vicinity was the fashionable quarter, but there are very few landmarks now existent to show the village of a hundred and fifty years ago.

The beautiful library of granite, once the City Hall, sands nakedly forlorn in the midst of ugly rows of stores, whirling dust, and the bare faced glare of pavements. For some almost criminally misguided reason, the city's officials have allowed the wonderful old elms crowning this chief square to be cut down. Once a beautiful park, a rest

ALONG A SHADED STREET IN OLD NEW BEDFORD.
From the Pencil Drawing by J. M. Rosé.

spot for eyes and minds, a noontime breathing place, and now a meaningless square of unsightly roof lines, crisscrossing wires, and curbed-in grass plots, this quarter of the city wears a woeful aspect to those who knew it as it was. Here stands the new City Hall, elegantly suited to the mediocre taste of its perpetrators, and serenely out of keeping with the atmosphere of the town, as are the other public buildings of late construction.

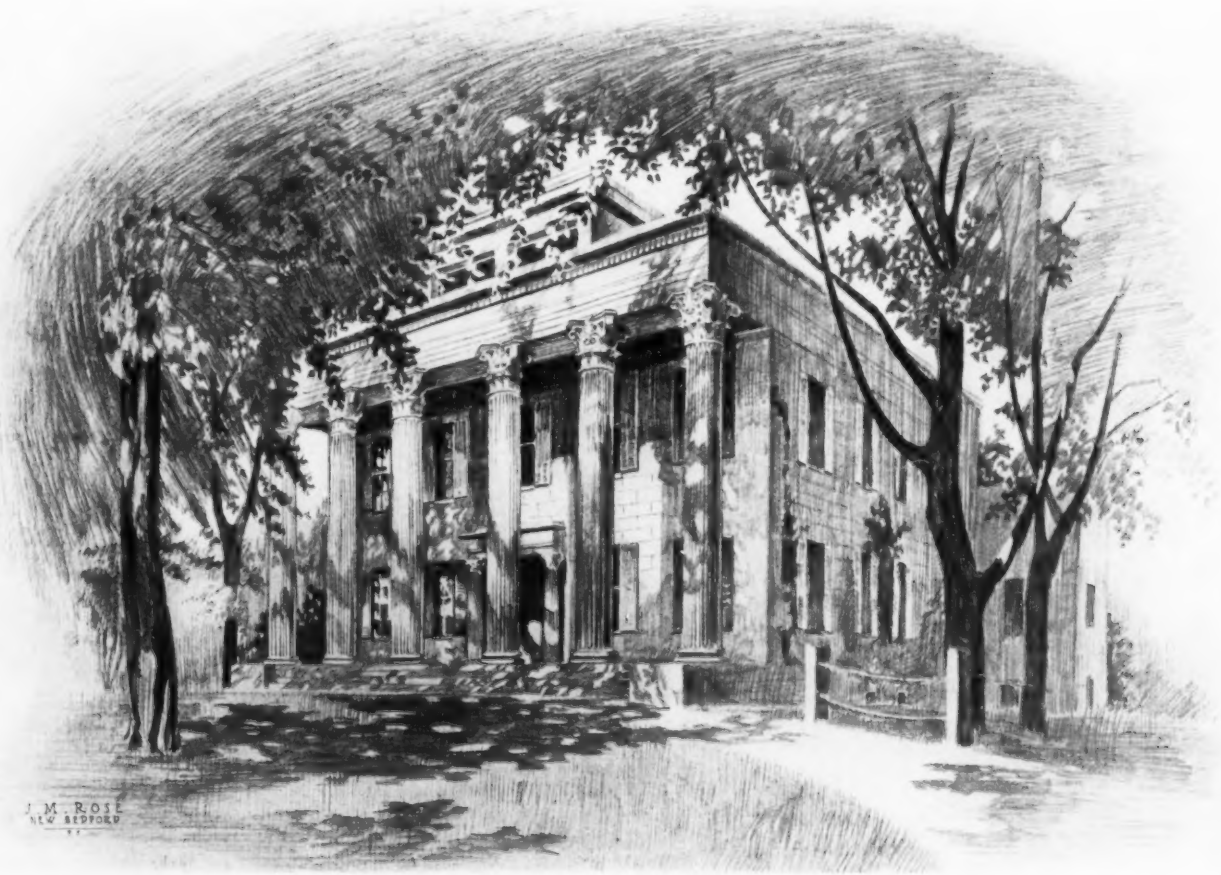
In happy contrast to these is the historic old Court House on County Street; in the days of Queen Anne, the original highroad leading to Plymouth, along which Church's soldiers drove their Indian captives, and later, Gray's regiment of Red Coats marched unchecked to do their work of pillage and destruction. Surrounded by fine trees, back from the wide street, vine grown and dignified, its venerable brick and excellent white trim make it a true thing of beauty. The delicate proportions of its characteristically colonial cupola are exactly pleasing and surmount a facade both simple and imposing. One sees in the building a splendid example of an eminently satisfying type. Here was held the famous Borden trial of Bristol county.

In the early twenties many fine old residences were built along this pleasant road; some with their grounds extending through what is now the heart of the city to the shore. There are a few good examples of the prevailing architecture left, though the house of John Avery Parker, perhaps the finest of them all, has recently been razed. This mansion was a literal treasure house, and was treated in demolition like the veriest shanty; the great columns of porphyry, rising through the hall to a clear two stories, smashed and broken out with the rude sledge and pick of the contractor's day laborers. These pillars, the oak wainscoting, panelling and carved hand rails and spindles, were brought over from Europe in the owner's merchant ships at the time of the construction of the house. There was no one that cared, no one to halt the work of destruction and save from devastating hands the delicate fan windows, the carvings, the heavy doors of mahogany, or the massive fire places. A junk dealer bought the silver door hinges and latches for a few cents. Delicate mouldings and shapely pilasters lay splintered in the plaster heaps.

New Bedford's wealth acquired in the days of whaling, slave trade, and coastwise shipping, built these fine residences of native granite. Of this period and style is the house now occupied by Dr. Hathaway, once the home of the first mayor, Abraham Howland. Approached by a semicircular drive, and shaded by New England elms, this house is imposing and effective, its gray stone giving it a feeling of permanency and some grandeur, well suited to its style of architecture. Six huge fluted columns, with capitals of the Corinthian order support the nicely proportioned cornice. The doorway gains prominence from the spacing of the columns, and is itself, with its flanking pillars and heavy lintel, a decorous part of an harmonious whole. The use of the Greek "portico," so common on the great southern estates, is not so often seen in New England, and there is a prevailing local feeling that it is eminently unsuitable. However that may be, these few similar houses of architectural pretentions stand as the expression of the wealth and taste of the controllers of foreign trade and whaling fleets in strong contrast to the stupidly elaborate residences of more recent erection.

Mrs. Hetty Green owns two fine old houses of granite and stucco of early building, which are fast falling into dilapidation owing to neglect and oversight. In New Bedford her property is considerable, and is not remarkable for its well-kept and attractive appearance.

The Society of Friends, who formed a large part of the population, helped make the little city the power it was in the past; for the whaling industry was more to their liking than either slave trade or smuggling, and in the palmy days large fortunes were made and later lost. No longer is their quaint garb seen on the quiet streets. The Friends' Meeting House is still faithfully attended by the descendants of the founders of the sect, but the old customs have



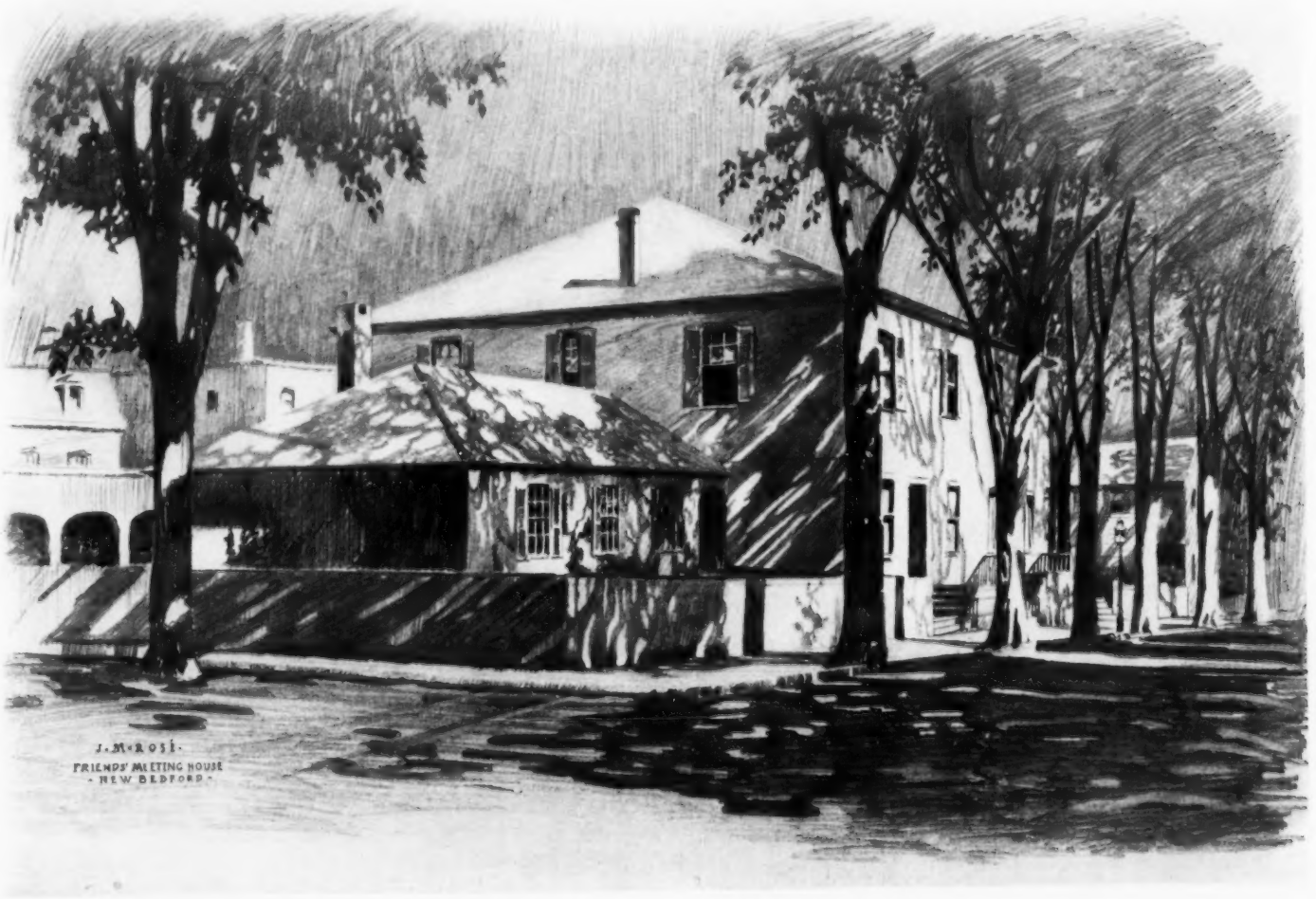
THE OLD HOWLAND HOUSE, NEW BEDFORD, MASS.
From the Pencil Drawing by J. M. Rosé.

died out, and worldly habits are no longer a reproach and a scandal. Very few residents can remember when the Hon. John Mason Williams, whiling away tedium in his pleasant office with the help of a German flute, caused such consternation among the Quaker passersby, who hastened out of reach of the vain sound, their fingers in their virtuous ears. Even the chaises of the wealthy Friends were decorously painted a modest drab, and the tale is still told in New Bedford of John Woodman, who serenely objected to traveling in the cabin of one of the packets on account of some trifling carving on the outside of that part of the vessel.

On the corner of one of the hill-climbing streets stands the Friends' Meeting House, seeming the very epitome of dignity and peace. Though close to the sidewalk, with its grounds only separated from the street by a low board fence, it has quite the effect of entirely withdrawing from the earthly affairs of the bustling town. Its severe and sombre painted brick facade, with its two simple entrances and curving iron railed stairs, mark it unmistakably as a Quakers' place of worship. The long rows of wagon sheds in the rear tell their story of faithful attendance from the surrounding countryside. Vines mantle the quiet walls, and elms cast their dripping purple shadows across the doorways. Nature does her

THE LEAST PRETENTIOUS OF NEW BEDFORD'S OLD HOUSES HAVE A PICTURESQUE QUALITY OF THEIR OWN.

From the Pencil Drawing by J. M. Rosé.


J.M.ROSI.
FRIENDS' MEETING HOUSE
- NEW BEDFORD -

best to soften the building's austerity, and rather gains by the neutral tinted background it offers to her foliage.

Some years have elapsed since a certain Quaker gentleman of none too firm a standing in the meeting, returned from a visit to Boston town, in flowered silk waistcoat, ruffles, and gold watch chain, and paraded the streets to the gentle horrification of the more saintly, twirling his walking stick, and saluting his old friends with a "Damme, sir, it's a beautiful morning!" That was the beginning of the end and soon the world crept gradually in.

Many are the charming corners in old New Bedford. The stately Quaker homes of brick or stucco, with their high walled gardens, and stable yards overhung with foliage, are delightful from every viewpoint. These square substantial homes are generally built close to the street, their comely stoops approached by a short flight of eight or ten steps leading directly from the sidewalk. Heavy vines cling to the brickwork, and creep fairly into the recesses of the windows. The wooden trim of window sash, blinds, cornices and porches is generally painted black or very dark green, and the house is surrounded by a simple iron or paling fence of the same shade. Though not nearly so beautiful in effect as white trim would be, this same dark color seems fully consistent with the modest tastes of its Quaker owners, and where it loses in elaboration it gains somewhat in sombre dignity, which the luxurious foliage does much to soften. Perhaps nothing strikes you more keenly in New Bedford, than the graceful sweeping arches of its shade trees, and the prolific growth of trailing vines over its finer houses. The whole residential section, which is by far the greater part of the little city, seems, on a sunny day, a vast flicker of light and shadow. The flaggings are overlaid with its tracery, and the humblest homes are made beautiful by the trembling lacework cast across their weatherbeaten walls. Today these Quaker domiciles still possess the same aloofness the past century knew, and as you pass along the streets rarely do you see a sign of their human inhabitants. One fully expects, when a door chances to open, to behold the modestly garbed figure of a Quaker maid coming sedately down the old stone steps. One wonders what histories of rebellious fun-loving youth contesting with the stern precepts of an austere religion went on within these doors, and many a half recalled legend bears its tale of protesting adolescence.

Among the other places of worship in New Bedford is found a good steeple, or some rather fine mouldings about the eaves and cornices, and occasionally a fine ensemble. In front of the granite Unitarian Church, built in 1836, is mounted on a low stone base, a heavy bronze bell of beautiful design, cracked, and green with age and exposure. It is said that this bell was originally brought from Seville, Spain, by the captain of a trading vessel, having been so commissioned by the people of Nantucket. Upon its arrival, the straight-laced congregation learning that it was one of a set of chimes that had adorned the belltower of a Franciscan monastery and had chanced to be blessed by the Pope, an extra touch which the genial Captain told with gusto, spurned the accursed thing and went unrung to their bare little church content in well-doing. The New Bedford church, less orthodox or broader minded, eagerly relieved the bewildered old salt of his erroneous purchase and enjoyed its sweet tones for many years.

The fine old water mills of the town were in working order scarcely fifty years ago, and not a few residents can remember the moss-covered overshot wheel and the fringed circular pond where the boys skated in winter. To these mills, the corn raised by the farmers was carried to be ground, and many a youngster can recall playing about the edges of the mill pool while his sack of corn meal was made ready for him. Nearly all the flax used in the village was raised by the surrounding landowners, and much of it was woven by the good house wives and made into garments and bedlinen. Open fireplaces and Franklin stoves heated the old houses, and it was not until Abraham Russell first introduced coal into the town by burning it in his own grate and

exclaiming, 'Open the doors and we will warm all New Bedford," that any fuel but peat and wood was used.

The homely charm of New England is intense in this little city. The sea winds, blowing in strong and salty from Vineyard Sound, clear away all the heat and smoke. Seen from the water front, the city climbs a green hill; its roofs all broken into interesting gabled glimpses by the lines of the tree tops. No barren spot shows, no ornate gilded dome disturbs the old gray prevailing tone. The church steeples are all a part of the general scheme, and the stone warehouses and occasional cupolas make up the consistent picture. From the low Fairhaven shore across the stream comes the scent of pines and sweetness of meadows. The massive and expensive public buildings, the gift of the wealthy man who loved his home town, rise majestically and somewhat unexpectedly from the low picturesque line of little homes and dark pointed fir trees.

It must be confessed that one occasionally finds New Bedford disappointing. A little street that glanced along from the corner seems delightfully quaint, proves on closer view to be hardly as quaint as it is commonplace. Nice old porches, substantial and plain, have had dabby little bow windows built over them. Fine deep eaves have been hung with gingerbread fret work and scroll saw absurdities. Here and there, the simple lines of a sane but unpretentious dwelling have been broken by a totally useless and really atrocious circular tower. Fresh paint of an ugly color spoils one good house, and the place of another has been lately taken by a cheap stucco residence fairly shouting new "mission" furniture and "elegant electroliers."

New Bedford is not changing so swiftly as to cause real anxiety to those who love her quiet streets, and it is safe to say that another quarter century will see her much as she is now. Though the greatest losses have been sustained in the past ten years, it is possible that the feeling evoked by them may be strong enough to preserve with avidity other treasures from destroying hands. The modern spirit is crude enough in its appreciation, and the constant clamor for progression deafens the ears of authority and drowns the voice of the elders pleading for the old. Youth's way is a way of change and activity, and the pressure of events leaves no time for the cultivation of the finer arts. The city must look to its men of attainment, its women of ideals, to stem the heedless tide of a growing population but lately naturalized. The children of the foreign born have several generations to progress before they will foster a veneration for their country's traditions and a protecting love for the old land marks. Education holds all this within her hands, and it is the high privilege of those who wait upon her to dispense her bounty with patient ready heart and seeing eyes. Would not the greater wisdom be, to thoroughly teach the very young the foundations of learning, the simple facts of mental processes and more than superficially the things of the heart and of the soul?

THE OLD SPANISH BELL.
From the Pencil Drawing by J. M. Rosé.

BARTON HARTSHORN MANOR HOUSE, ENGLAND.
SIR ROBERT S. LORIMER, ARCHITECT.

THATCHED STABLE WITH CASEMENT WINDOWS, POLLARD'S WOOD GRANGE, ENGLAND.
Forbes and Tate, Architects.

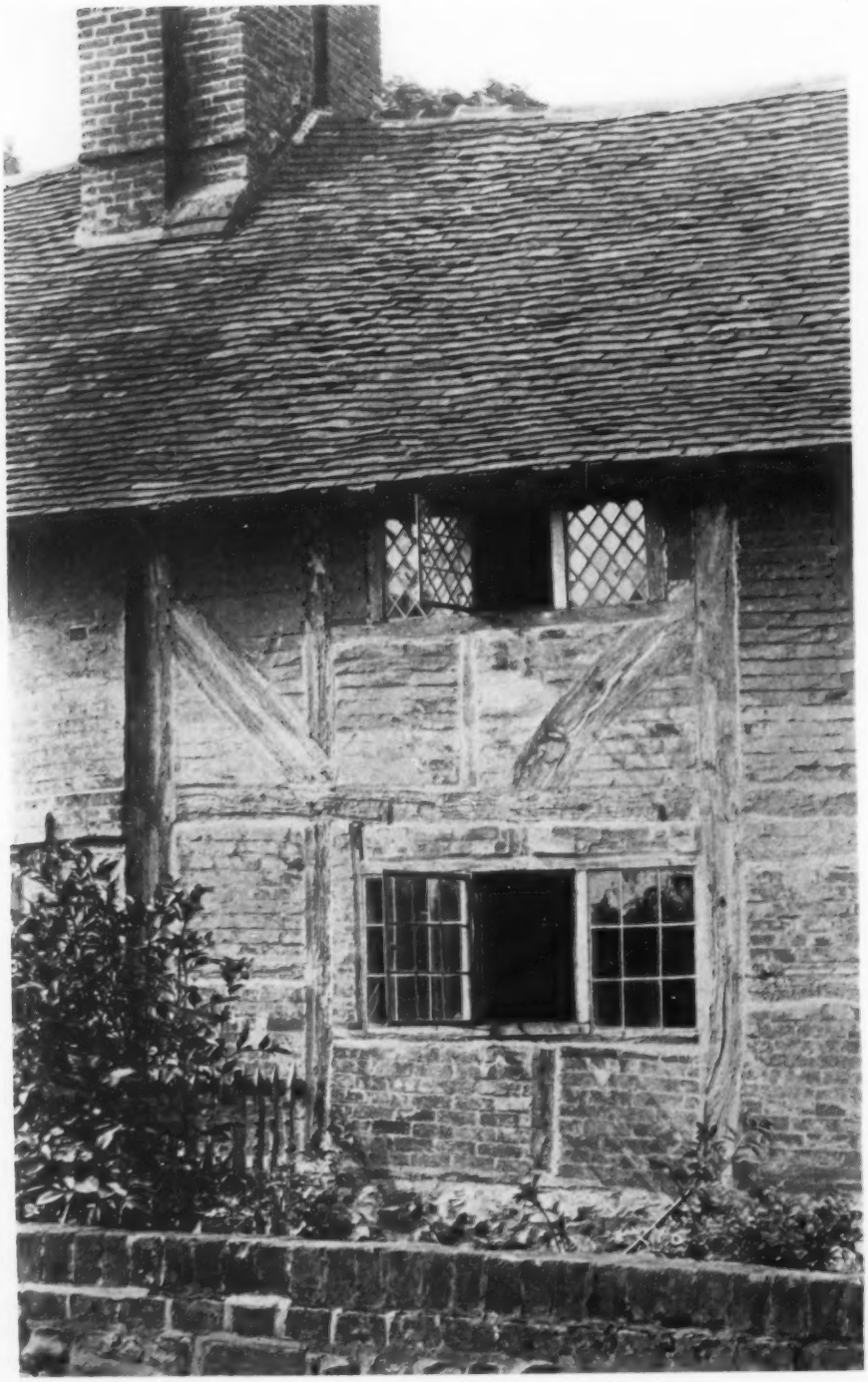
RETVRNING TO THE CASEMENT WINDOW

BY ALWYN T. COVELL

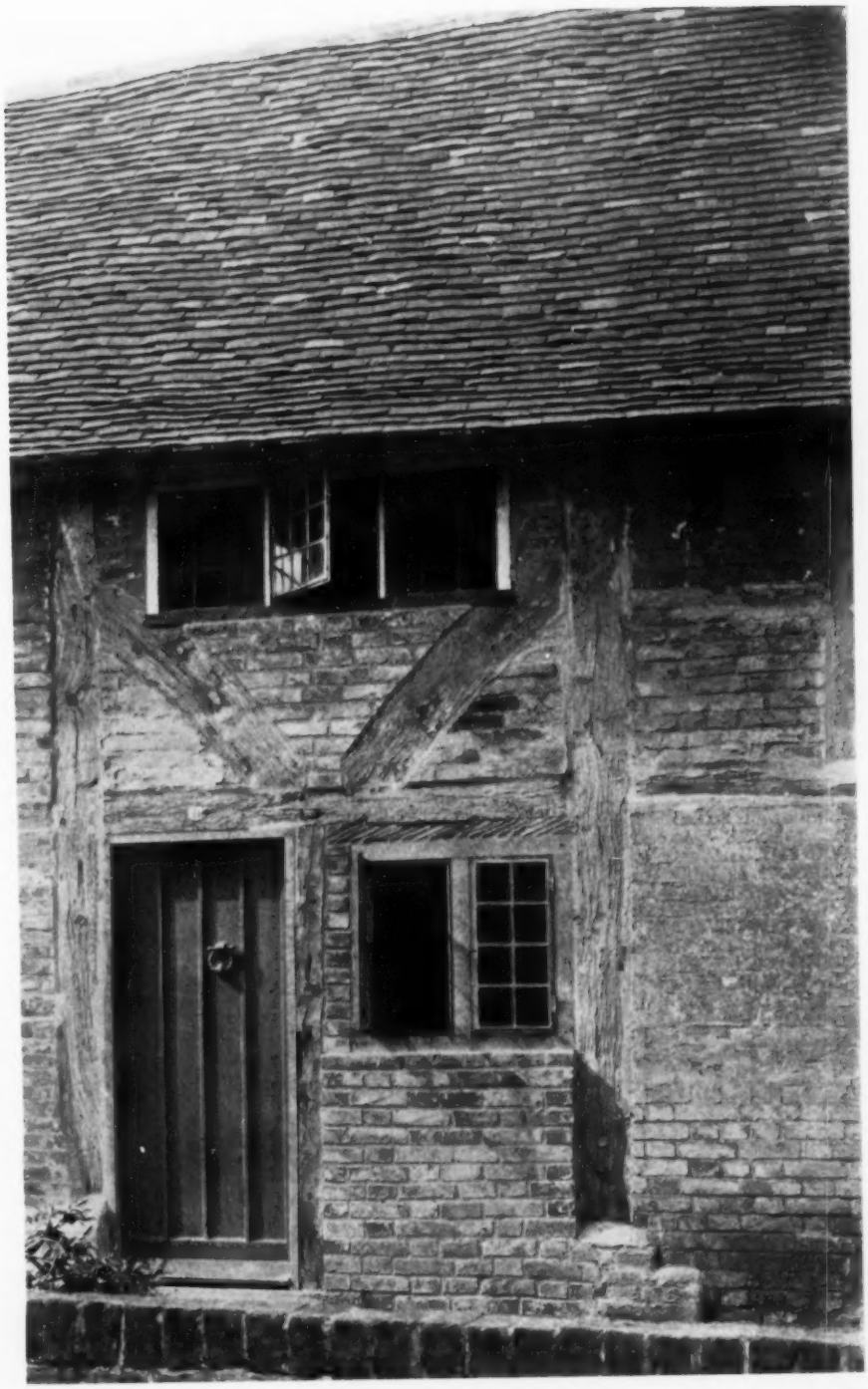
CERTAIN details,—chimneys, roofs, windows, decide the architectural character of a building more radically than more superficial elements of "style." Perhaps these things are too important to be classed as details, for certainly one had rather see a building of no specific "style" (the bane of modern architecture) yet one which possesses strong qualities of *character* by reason of the architectural fitness of its detailed parts.

If the contention that our architecture is kept on a general plane of mediocrity through the prevalent tendency to copy, is a misleading or unfair contention, the arraignment might better be differently stated. It might be said that it is not because we copy that we often fail, but rather that we do not often enough copy good examples.

It has been rather thoroughly thrashed out that a copy or a close adaptation of a good example is greatly to be preferred to an original design which is accepted for no reason other than its originality. Originality as an end rather than a means in architectural expression rarely if ever produces sound and last-



DETAIL OF COTTAGE, EAST CLANDON, ENGLAND.
H. S. GOODHART-RENDEL, ARCHITECT.



DETAIL OF COTTAGE, EAST CLANDON, ENGLAND.
H. S. GOODHART-RENDEL, ARCHITECT.

CASEMENTS GROUPED WITH A DOOR—ENTRANCE TO THE OFFICES OF MELLOR AND MEIGS, PHILADELPHIA, PA.

Mellor and Meigs, Architects.

ing results. The great architectural expressions of the past have lived to form the solid bases of design today only because they were intrinsically good. Much that was merely "original" has perished so that not a trace of it exists.

With this in mind, with an intent to develop precedent with intelligence rather than to shun it on principle, a few salient facts begin to take shape from the architectural kaleidescope which daily confuses the eye and mind. We perceive (with all the ardor of new discovery) that Gothic, in its several forms, is undoubtedly the best type of architecture for a church. We find that the classic orders, reverently used, are probably the best that have been evolved for public or monumental buildings. And among these amazing discoveries of things which we have always known but often sought to evade, is the conviction that the English type of domestic architecture is the happiest type for the country house, for the very simple reason that it conveys a greater impression of domesticity than any other. Even our own early farm-house type, homely as it is, does not equal the English house (even in its own class), because the picturesque formed no part of its make-up, and because its severity was a little uncompromising.

Upon deciding that an adaptation of the English idea of country cottage, or large country manor, is the desideratum, it is interesting (and a little disheartening) to notice how very wide of the mark

DUNCHURCH LODGE, RUGBY, ENGLAND.
GILBERT FRASER, ARCHITECT.

CASEMENT WINDOWS IN SOUTH WRAXHALL MANOR HOUSE, WILTSHIRE, ENGLAND.

most of such adaptations fall. Country houses that cannot immediately be identified as American are so rare as to be countable. Perhaps Wilson Eyre has succeeded more consistently than any other architect in this country in interpreting in an American country house certain happy ideals of the English country house. Albro and Lindeberg and Grosvenor Atterbury, as well as certain of the Pennsylvania architects, have successfully grasped the idea.

The many architects whose work in country house design is mostly a hybrid compromise, have failed more disastrously in their execution than in their ideals. They have intended to build after the manner of Lutyens or Voysey or the others of the English country house architects, and have expressed this intention in the wrong dialect, or rather in the wrong application of detail. The usual Anglo-American country house is as little a success as would be a monologue imitation of an Englishman rendered with a Yankee twang of speech. Without going into the deeper reasons why the American builds his house in a different manner from the Briton; without, in fact, discussing anything as basic as "The English Point of View in Architecture," it is certainly interesting, and maybe profitable, to study certain of the more superficial reasons for our recurrent failures.

Something was said at the beginning of this article about chimneys, roofs and windows.

Perhaps of these three details we have most conspicuously ignored the saliently picturesque quality of the English window. It is impossible that we have failed to observe. It seems only to remain that we have wilfully or stupidly ignored.

Few architectural features are as difficult to reconcile with English domestic architecture as the American double-

hung window, especially when it is glazed with the uncompromisingly blank expanse of a single pane of glass. The wide popularity of the double-hung window is, perhaps, due more to a correspondingly wide misconception of the casement window. The casement seems too often to have been dismissed as "picturesque but impracticable."

Many architects, it should be said, in all fairness, would use casement windows in preference to any other type if they could overcome the unfounded but often obstinate prejudices of their clients in the matter. The client's objection is equaled in its obstinacy only by the peculiar vagueness of the premises underlying it. Usually, upon cross-examination, it will be found that some one has told him not to have casement windows in the house he is going to build. Questioned further as to why, he may say that they cannot be made weather-tight, that they are hard to clean and that they are easily forced. Here are three bristling objections—objections so potent that the vine-clad English cottage of his dreams never materializes more closely than a disappointing approximation, for the reason that he has failed to appreciate that no one feature contributes more to the charm of the English type of house than the casement window.

Look at the work of C. F. A. Voysey, of Edwin L. Lutyens or of any of the host of successful English architects, and analyze the type of house they have created. A quaint and interesting roof, an unexpected sort of chimney, perhaps, or a buttress here and there, and a picturesque texture in some local slate or tile—but above all, casement windows, singly or in groups. The small leaded panes are in scale with the shingles or bricks or stones of the wall. The natu-

AN INTERIOR IN SOUTH WRAXHALL MANOR HOUSE, WILTSHIRE, ENGLAND.
In a restoration of this old manor, modern metal casements were installed.

ral irregularity of the leading causes the panes of glass to stand at slightly varying angles with the sun—some panes brilliant by reflection and others dark. Interesting groups, windows close together, are possible for the reason that the bulky sash-weight box of two adjacent double-hung windows is eliminated. Certainly the effect is thoroughly pleasing from the picturesque point of view, and the prospective builder has quite decided that he must and will have casement windows—until someone tells him that they are a delusion and a snare. Many a man would have the house he may have dreamed of for years if it were not for the officious "advice" of his friends. And this advice is always of things to avoid and never of things to do. An architect finds it a pleasant undertaking to build a house that will please his client, but often comes to despair of pleasing twenty or so of his client's friends at the same time.

So it often fares with the casement windows that were admired in the drawings, but condemned by the inevitable and ubiquitous "friend." The client hurries back to the architect to impart to him the three dire detriments enumerated above, and the architect is rarely able to dispel the prejudice. All the houses in the same street, or in the same suburb have double-hung windows, *ergo*, there must be something wrong with casement windows. Absurd as these "reasons" may seem, they are, nevertheless, sufficiently potent to sway many prospective builders away from what they consider a very risky experiment.

That the only three possible objections to the casement window are entirely unfounded either on fact or reason seems almost too obvious to enlarge upon. To say that a casement window cannot be made weather-tight is no more or no less true than to say that a roof cannot be made weather-tight. Poor detailing and poor workmanship will expose any exterior detail to danger of deterioration, but the well detailed casement, whether of wood or of metal, is no less protection against the elements than a double-hung window.

On the score of cleaning, perhaps a little more weight lies in the objected difficulty. This, however, can be obviated by so hinging the casements that one may be reached through the next, and by having them sufficiently narrow so that the span of the arm can reach the far side. One type of casement is so designed that its hinge throws it, when open, half within the room and half outside.

That a casement window is easily forced is the most absurd claim of the three objections enumerated, for in addition to the various latches and fastenings devised, there is the cremorne bolt, a metal rod which can be thrust by operating a central knob into metal pockets imbedded in the sill and head of the window. Where a metal casement is to be forced, the entire glass and leading must be removed before entrance could be effected.

Referring again to the grouping of casements, this point enters the ventilation question. A single casement window may be opened to the full extent of the wall opening, by throwing it wide, or may be fixed open at any lesser angle by means of a sliding bar and set-screw on the sill, now devised to operate even when the windows are equipped with fly screens. If the objection is entered that the vertical opening of the window may cause a lower cold draught in the room than the opening of a double-hung window at the top, this may be obviated by placing pivoted transom sash above each casement.

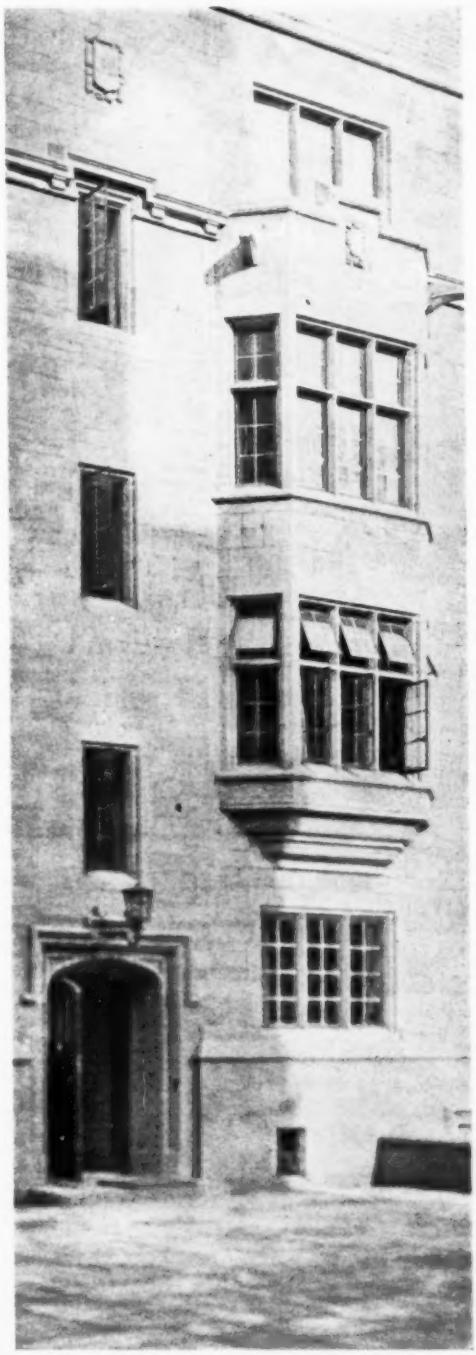
A significant feature of design in detailing rows of casement windows is the fact that the mullions separating them may be less than half the width of the mullion required between two adjacent double-hung windows with their sash-weight boxes. This narrow mullion possible with the casement adds greatly to the lightness and grace of a bay or oriel window, and affords, as well, a maximum void and minimum solid in any given glazed wall-opening.

It is not necessarily true that a casement window is always the best type, but it is to be contended that it is absolutely essential to the rendering of any house of the English domestic type and

equally essential in buildings of the eighteenth century French type.

To state that the casement is the logical window seems a little like stating that a roof is the logical covering for a house, yet the use of the casement window in this country has been limited to an amazingly small proportion of buildings. Only within the last few years has the casement window come to be regarded here and there as anything but an experiment, an affectation or an innovation. It is hard to conjecture why it has taken the architects of this country so long to accept what has been a part of European architecture for several centuries, and yet, on examination, it would prove in most cases to be the owner and not the architect who has vetoed the casement type of window. And to conjecture as to the reason for this is to revert to the three objections mentioned above, the life and existence of which is due to passing from hand to hand without investigation or serious thought.

If objection is made to the appearance of a casement window, that is one thing, but objections on this score are rarely heard, and are to be recorded only as matters of individual personal taste. An objection on the score of the practical, however, is another matter, and this (with no logical foundation on fact) is the most common type of objection. Cost is a third (and often a potent) consideration. In a building of cheap construction the casement is out of the question for the reason that double-hung windows of various stock sizes may be had from any sash and blind factory, whereas the casement must be specially detailed and specially made. In a building where cost is not the paramount consideration, however, and where appearance comes first, the casement may well be figured in, even to the greater expense of metal type. In a house of brick or stone the non-deterioration of the metal casement is worthy of estimate. Such a building, with walls of masonry, roof of slate or tile, rain-leaders, gutters and flashing of lead or copper, and metal casement windows, there is no one external feature which can suffer deterioration from the elements.



THE SMALL PANE OF THE LEADED CASEMENT GIVES AN EFFECT OF SCALE.

The QUESTION OF HEAT & VENTILATION

BY CHARLES L. HUBBARD, ENGINEER

THE heating of a dwelling house is commonly regarded as a simple matter, and at first thought it may hardly seem worth while to take the time for a special study of the subject. The equipment of large public buildings naturally appeals more strongly both to the architect and engineer, and often results in a tendency to turn the designing of less important work over to the heating contractor, who, in some cases, may be more interested in his profit than the successful and efficient operation of the plant.

The object of the present article is to present in simple and concise form a considerable amount of practical data relating to this particular class of work, arranged with special reference to the needs of the architect, both in laying out heating plants himself and in checking those of others.

GENERAL REQUIREMENTS.

The first requirement of any heating system is that each part of the equipment shall be properly proportioned with reference to the others, and that the entire apparatus shall have sufficient capacity to warm the building in the coldest weather. Economy of operation should also be considered, as well as ultimate capacity. For example, a certain size of furnace may be capable of warming a building, if forced sufficiently, but with a large waste of heat passing up the chimney. A larger furnace will cost more in the beginning, but will be much more economical and satisfactory in the end, because it can be operated under normal and efficient conditions. Other requirements are simplicity, flexibility, and ample fire-box capacity. The apparatus should be simple because its care falls to those unfamiliar with mechanical devices; flexible, in order that the heat may be regulated according to outside weather conditions; and provided with a large fire-box to increase the length of time between periods of firing.

VENTILATION.

It is as important to provide suitable means for a supply of fresh air in the average dwelling house as in the largest school building or theatre, although the requirements are entirely different. In the ordinary sized room, occupied by one or two people, there will usually be sufficient ventilation from leakage, which under average conditions, will amount to at least one complete change of air per hour. This, however, can be increased by a slight opening of the windows without producing uncomfortable drafts if the room is properly warmed. It is only necessary to shift the sashes a small amount so that the air may pass between them in a thin sheet.

Some of the forms of window ventilators or deflectors which are placed beneath the lower sash are a help in this class of work, although the volume of air admitted is so small that it does not meet the requirements of rooms at all crowded. The common practice of sleeping with open windows takes care of bedroom ventilation to a large extent, while the dining room is occupied for only a short time and is filled with fresh air in the morning from leakage during the night. The room requiring special means for a positive supply of fresh

warm air is the living room, where the family sits for three or four hours at a time, and commonly with burning lamps or gas jets vitiating the atmosphere. With a properly designed furnace system the matter of ventilation is well cared for, and this can also be done in the case of steam and hot water, if the living room, and possibly the front hall, are heated by indirect surface. This should not add greatly to the expense, as a single large stack may be made to deliver warm air into both rooms. By leaving the various doors open into the hallway a good degree of ventilation may be secured throughout the entire house. Fireplaces are always efficient as ventilators, provided there are fires in them to produce an outward draft. A cold flue is of practically no value for this purpose unless there is sufficient pressure within the room to force the air through it. Down drafts of cold air are often produced by unused fireplace flues, and while this is pure, it is not delivered in a manner adapted to ventilating purposes. It should be mentioned, however, that the conditions noted are for a minimum air supply, and that these should be enlarged upon in each particular case as much as the available funds will allow.

HUMIDITY.

A proper degree of humidity adds much to the comfort and health of the occupants of a building, but is difficult to secure in the case of a dwelling house. In large buildings, employing ventilating fans, moisture may be given to the entering air by means of steam jets, fine sprays of water, and by means of air washers. None of these are practicable in the average dwelling house, and evaporation must be depended upon in cases of this kind. The water pan inside the casing of the average furnace amounts to but little on account of its small size. In a test recently reported, the evaporation produced by this means amounted to only 3 quarts of water per day, and increased the humidity of the building only 1 per cent. By placing two extra pans inside the furnace casing, thus increasing the capacity to 72 quarts, an evaporation of 20 to 24 quarts of water was obtained per 24 hours. In average winter weather, ranging from 20 to 30 degrees, from 12 to 15 quarts of water were evaporated per day, thus maintaining a humidity of 35 to 40 per cent. Although the normal humidity for occupied rooms is 70 per cent., it is not usually practical to carry it much above 50 per cent., even if the humidifying apparatus is capable of exceeding this. With a proper degree of humidity a temperature of 62 to 64 degrees seems as warm as one of 70 to 72 degrees with a dryer atmosphere. At the present time, evaporating pans used in connection with hot air furnaces and indirect steam and hot water, seem to be the only practical means of increasing the humidity in dwelling houses.

SELECTING A SYSTEM.

The systems of heating adapted to the warming of dwellings are hot air furnaces, steam and hot water. Furnace heating is often combined with hot water, and both steam and hot water are adapted equally well to direct and indirect heating. It is proposed to take up each of these systems briefly, stating its advantages and disadvantages, and showing how the latter may be overcome under certain conditions.

HOT AIR HEATING.

This is the simplest system of heating and the least expensive to install. It furnishes fresh air for ventilation, warms up the rooms quickly in the morning, is easily regulated as to volume of heat supplied, avoids damage to the apparatus from freezing in unoccupied rooms and the flooding of floors and ceilings from leaking air valves. The chief disadvantage is the unevenness of the heat supply to different parts of the building, and the difficulty experienced in forcing the warm air into certain rooms in case of high winds. Other objections of less importance are the ease with which dust and ashes are carried through the flues from the basement to the upper part of the house, and the dry and over-heated quality of the air when the furnace is too small for its work. Unevenness of heat distribution may be largely overcome by locating the furnace so as to shorten the hot air pipes leading to

northerly rooms, especially those on the first floor. Horizontal pipes should be made of gererous size, given an upward pitch when possible, and limited in length to 10 or 12 feet, except under special conditions. Overheated air may be avoided by using a furnace with generous air passages and heating surfaces, so that a comparatively large volume of air will be supplied at a moderate temperature. The method of furnishing the cold air is also an important matter, as will be described later. In general, the conditions required for successful furnace heating are more easily realized in a small house than in a large one, and for those of six to eight rooms this is probably one of the most satisfactory systems of heating, when everything is considered. Buildings of large size may also be successfully heated with hot air, but require special care in design and installation.

STEAM HEATING.

A system of steam heating is more expensive to install than a furnace, but has certain advantages, especially in houses of large size. Heat may be carried to any room regardless of its distance from the boiler or the direction and strength of the wind. The fuel may be burned under a single boiler, or battery of boilers, which results both in a higher efficiency and greater convenience, while large houses heated with hot air require more than one furnace on account of the limit to the length of the warm-air pipes. With steam, a combination of direct and indirect surface may be used, placing the former where ventilation is not required or where it is obtained in sufficient amount by leakage or through open windows. Other rooms, like living room, library, nursery, etc., which require a continuous supply of fresh warm air, should be heated by indirect surface. With a furnace, heat can only be furnished in connection with ventilation, while with direct steam the heat supply is independent of other conditions and therefore more economical to operate. The chief disadvantage of furnace heating is avoided by indirect as well as by direct steam heating, because the stacks may be placed directly at the bases of the flues to be supplied, thus doing away with runs of horizontal pipe. There is no danger of freezing in the case of a steam system, except in sealed returns in the basement, and it is usually a simple matter to protect these sufficiently to avoid danger. The two principal disadvantages in connection with steam are the difficulty in regulating the heat supply with direct surface, and the fact that when the pressure falls in the boiler the radiators become cold. With a furnace, a certain amount of heat will be given out during the night, even with a banked or low fire, while with steam there will be no heat supplied unless there is sufficient fire to raise the pressure. Heat regulation with direct steam is commonly obtained in three ways. The best, and also most expensive, is by means of one of the pneumatic systems, which shuts off and turns on the steam automatically by means of a thermostat placed in the room. Another method makes use of a fractional or graduated hand valve in connection with one of the vapor or vacuum systems, so that the amount of steam admitted to the radiator may be varied to suit requirements.

In other systems of this general type the temperature of the house, as a whole, is varied by changing the steam pressure, carrying it considerably below that of the atmosphere in mild weather. One of the most satisfactory methods of regulating a direct steam system is to divide each radiator into two parts, in the ratio of 1 to 2, by means of a blank nipple. Each part should have its own steam connection and air valve, and becomes practically an independent unit. With this arrangement, 1/3, 2/3, or 3/3 of the surface may be used, as temperature conditions may demand. This method is not expensive to install and will pay for itself in a few seasons, in the saving of fuel, to say nothing of the greater convenience and comfort obtained by its use.

By providing "vacuum" air valves, so called, upon the radiators, and taking special care to make the system of piping as nearly air tight as possible, a vapor considerably below atmospheric pressure may often be carried all night

with a low fire, thus securing much the same result as with a furnace in this respect. An objection often raised against steam heating is the noise from water hammer in pipes and radiators.

There is no excuse for any trouble of this kind with the low pressures and short runs of pipe employed in dwelling house work. A properly designed system of piping, with suitable air venting, should entirely do away with any difficulty of this kind.

Indirect radiation in the more important rooms, and special care in the decoration of direct radiators, will largely remove the objection of appearance often raised by owners and architects when considering steam heat. From the above, it would appear that for buildings of more than eight rooms, a properly designed system of steam heating would prove more satisfactory than hot air under ordinary conditions. For large apartment houses steam and hot water are the only practical means of heating, for in this case, heat for an entire block may be generated in a single boiler, or battery of boilers, under the care of a day and a night fireman.

HOT WATER HEATING.

Much that has been said in regard to steam applies also to hot water. Among the principal advantages claimed for this system of heating is its flexibility, it being possible to circulate the water at varying temperatures corresponding with the outside weather conditions. Hot water is noisless in action, and the air in a house heated by this method often has a quality not obtained by the hotter surfaces employed in steam and furnace heating.

As the water is circulated at a temperature somewhat below that of low pressure steam the radiators and pipes must be larger, which of course adds to the cost of installation. On the other hand, the ease with which the heating capacity may be gauged to the requirements, reduces the cost of operation to such an extent that there is but little difference in the final expense of the two systems. One disadvantage with hot water in cold climates is the danger of freezing, especially in unused rooms where it is desired to shut off the heat. This is commonly provided against by drilling a ⅛-inch hole through the valve gate so that a small amount of water will flow through the radiator, even when the valve is closed, thus taking off the chill and preventing freezing. A hot water system is slow in warming up in the morning, but will give off a mild heat during the night on a banked fire, which is a very desirable feature.

The popular idea that the air in a house heated by steam or hot water is less dry than in a furnace heated house, is a mistaken one, as passing the air over the heating surfaces of a furnace does not change the moisture which it contains one way or the other.

In conclusion, we may say that while the advantages of hot air and steam are governed somewhat by the size of the building, hot water is adapted to any size, and is commonly chosen for the particular merits noted above.

COMPUTATIONS AND DESIGN.

The first step in designing a heating plant, whatever the type, is to determine the heat loss from the different rooms. This is made up of two parts, as follows: First, that due to conduction through walls and windows, and second, that caused by the leakage of warm air around doors and windows, and through the walls themselves, to some extent.

For dwellings of ordinary construction, the following rule may be used for a minimum outside temperature of zero:

Multiply the outside wall surface by 20, the window surface by 85, add the results, and correct for special conditions by the following factors. This gives the heat loss in thermal units (T. U.) per hour:

For the very best construction	x 1.0
For good construction	x 1.1
For fair construction	x 1.2
For poor construction	x 1.3
For North exposure	x 1.32
For East exposure	x 1.12
For South exposure	x 1.00
For West exposure	x 1.20
For N. E., S. W. or total exposure	x 1.16

For a room having a cold attic above, or unheated basement below, multiply the computed heat loss by 1.1.

Example (1). A corner room, in a building of fair construction, has an outside wall surface of 200 square feet and a glass surface of 60 square feet. The room has a cold attic above, and a Northwest exposure. What will be the total heat loss in thermal units per hour, in zero weather?

Solution:

Loss through walls,	200x20 =	4,000
Loss through windows,	60x85 =	5,100
Total,		9,100 T.U.

Correcting this for leakage (fair construction), exposure, and cold attic, we have $9,100 \times 1.2 \times 1.26 \times 1.1 = 15,106$ T. U.

In computing the heat loss from an entire building for determining the size of furnace or boiler, or for checking the total radiation as proposed by a competing contractor, the method is practically the same as that described above, except the factor for exposure becomes 1.16 (total exposure). After computing the heat loss for the different rooms, and for the entire building, and tabulating the results, we have the necessary data for designing a heating system of any kind desired.

In what follows, let the symbol "H" equal the heat loss in T. U. per hour from the whole building, and "h" equal the heat loss from a single room, under the same conditions, as computed by the methods given above.

THE DESIGN OF HOT-AIR PLANTS.

The heat delivered to a room by a hot-air furnace may be considered as being made up of two parts; first, that required to warm the outside air up to the temperature of the room (70 degrees); and second, the quantity h, to offset the loss by conduction and leakage. In the best class of residence work the air is delivered to the rooms at a temperature of about 120 degrees in zero weather, under which condition, the total heat to be supplied by the furnace will be equal to $2.4 \times H$, and for any given room, $2.4 \times h$.

THE FURNACE.

The size or capacity of a furnace is commonly based on the grate area, and this in turn, is determined by the rate of combustion and the efficiency.

Under average conditions both of these diminish with the size of grate. Table 1, based on experience, gives the T.U. which we may expect to utilize from the coal burned on each square foot of grate surface per hour for furnaces of different make.

Table I.

Sq. ft of grate area (G)	T.U. utilized per sq. ft. of grate area, per hour (E)
1 and 2	24,000
3 and 4	28,000
5 and 6	32,000

To find the required grate area (G) in any given case, first compute the value of H for the building, multiply this by 2.4, and divide the result by the number (E) in column 2, corresponding to the limits of the probable area as given in column 1. If the grate area, as found, does not come within the limits expected, try the next divisor from column 2, either above or below as the case may call for.

Example (2). The total heat loss from a house in zero weather (H) is 50,000 T. U. per hour. What should be the grate area of the furnace?

Solution:

$$G = \frac{50{,}000 \times 2.4}{28{,}000} = 4.3 \text{ square feet,}$$

which corresponds to a 28-inch round grate. Table II gives standard sized grates and their corresponding areas in square feet.

Table II.

Diameter of grate, in inches.	Area, in square feet.
18	1.77
20	2.18
22	2.64
24	3.14
26	3.69
28	4.27
30	4.91
32	5.58

Furnaces are of two general types, known as "direct-draft" and "indirect-draft." The principle of the direct-draft furnace is illustrated in diagram in Fig. 1. In this case the gases pass from the top of the dome or combustion

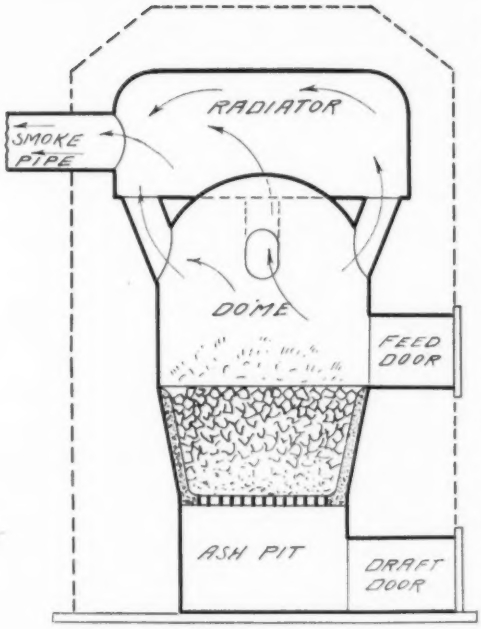


Figure 1.

chamber into the smoke pipe, by way of passages more or less direct. The best makes of this type are provided with baffles or deflectors which cause the gases to give up a considerable portion of their heat before entering the chimney. In the second type, shown in Fig. 2, the gases first pass downward to a radiator near the base and then upward through another flue to the smoke pipe. A damper is provided for giving a direct connection with the chimney, for use when coal is first put on. Either form will give good results when properly designed, but the cheaper grades are commonly of the direct-draft type, and greater care should therefore be taken when choosing one of this kind.

HOT-AIR PIPES.

The size of hot-air pipe connecting the furnace with a given room is based on the volume of air required to bring in the necessary heat to offset that lost by conduction and leakage (h). With an entering temperature of 120 degrees in zero weather, this will require $\frac{h}{0.9}$ cubic feet of air per hour. Assuming a velocity of 200 feet per minute through pipes leading to the first story, and 350 feet per minute to the second, the required area of the pipe will be

$\frac{h}{0.9 \times 60 \times 200}$ or $\frac{h}{10{,}800}$ sq. ft. for first floor rooms, and

$\frac{h}{0.9 \times 60 \times 350}$ or $\frac{h}{18{,}900}$ sq. ft. for second floor rooms.

Example (3). The heat loss from a first floor room is 15,000 T.U. per hour, what should be the area of the hot-air pipe supplying it?

Solution:

$15{,}000 \div 10{,}800 = 1.4$ sq. ft.,

which corresponds to a 16-inch round pipe.

Table III gives areas of pipes of different diameters:

Table III.

Diameter of pipe, in inches.	Area in sq. inches.	Area in sq. ft.
8	50	0.34
9	64	0.44
10	78	0.54
11	95	0.66
12	113	0.78
13	133	0.92
14	154	1.06
15	177	1.23
16	200	1.40

While round pipes give the best results, it is not always possible to provide sufficient space for them, and flat or oval pipes must be used instead.

Table IV gives the capacity of oval pipes:

Table IV.

Dimension of pipe, in inches.	Area, in square inches.
8 ovaled to 5	43
9 " " 5	51
9 " " 6	57
10 " " 5	59
10 " " 6	67
11 " " 6	75
11 " " 7	82
12 " " 6	85
12 " " 7	93
12 " " 8	101
14 " " 7	115
14 " " 8	126
16 " " 9	163
16 " " 10	17.

In carrying up the hot-air flues a clear space of at least ½-inch should be left between them and studding, and the latter should be carefully timed. Wire lath or asbestos board should always be used instead of wooden lath for covering in flues of this kind. The best arrangement for connecting the furnace with the vertical flues, when there is sufficient space, is shown in Fig. 3.

REGISTERS.

The registers which control the supply of warm air to the rooms generally have a net area equal to about 70 per cent. of their over-all area, and this should be from 10 to 12 per cent. greater than that of the pipe connecting with it. It is common practice to use registers having the short dimension equal to the diameter of the pipe, and the long dimension about 50 per cent. greater. Table V gives standard sizes of registers for different diameters of pipe.

Table V.

Diameter of pipe, inches.	Size of register, inches.
6	6 by 10
7	7 by 10
8	8 by 10
9	9 by 14
10	10 by 14
11	11 by 16
12	12 by 16
13	14 by 20
14	14 by 22
15	15 by 22
16	16 by 24

COLD AIR SUPPLY.

The supply of an ample volume of fresh air is essential to the satisfactory operation of a hot-air furnace. Shutting the cold-air box to get more heat into the rooms is like shutting off the steam pipe between the boiler and radiators, because the medium for carrying the heat to the rooms is cut off in either case. When space is available, much better results will be obtained if a cold air chamber is provided, as shown in Fig. 4. This, for the ordinary sized house, should be about 4 feet square, and of sufficient height to include the inlet window. Its effect is to break up sudden gusts of wind and produce a more even flow of air through the various pipes. The area of the cold-air window and

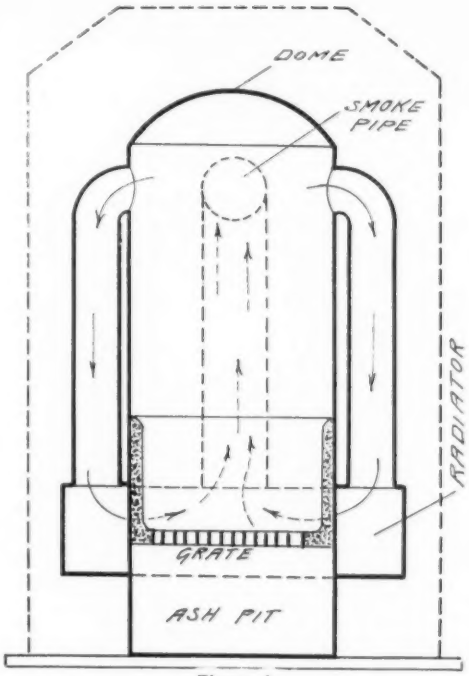


Figure 2.

duct should be at least 80 per cent. of the total area of all the hot-air pipes connecting with the furnace.

RETURN DUCT.

This is an arrangement whereby a portion, or all, of the air supplied to the furnace may be taken temporarily from inside the house. The return duct is commonly connected with a large register in the front hall and leads to the cold air chamber or duct, joining it in such a manner that the outside air cannot flow into it. This arrangement

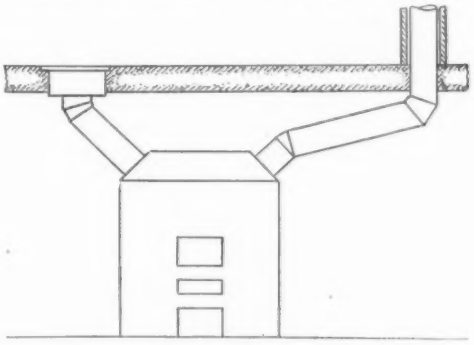


Figure 3.

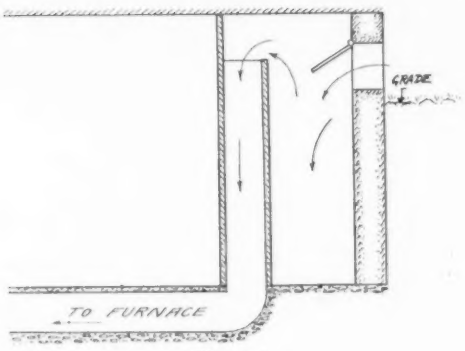


Figure 4.

is for use on cold and windy days when there is a good deal of inward leakage, and for warming up the house quickly in the morning. A switch damper should be provided for shutting off the outside air, and admitting that from the return duct by a single operation. Such a device is shown in principle in Fig. 5.

COMBINATION SYSTEMS.

When there are rooms which are difficult to reach with hot-air pipes, and where heat is of more importance than ventilation, hot-water radiators may be used in combination with a furnace. The water is heated for this purpose either by suspending coils of pipe above the fire or placing hollow cast-iron sections in the fire-pot, through which it circulates. One square foot of pipe surface suspended above the fire will supply from 20 to 25 square feet of radiation, while a square foot of cast-iron surface in contact with the fire will supply about twice that amount.

THE DESIGN OF STEAM PLANTS.

Here, as in the case of furnace heating, the first step is to compute the total heat loss from the building per hour in the coldest weather (H), and also for each room to be heated (h). The value of H may be taken as the sum of the heat losses from the different rooms, or it may be computed separately. It is often a good plan to compute it both ways as a check upon results.

BOILERS.

With house-heating boilers of the best design, the ratio of heating surface to grate area commonly varies from 15 to 25. It is customary to rate boilers of this type upon the grate area which they contain, assuming different rates of combustion for the various sizes in a manner similar to that already described for furnaces. Table VI may be used either for steam or hot-water boilers, as it is based upon the heat units to be supplied and not upon the square feet of radiation. The assumed rates of combustion are slightly different in this case than in Table I, simply because a wider range of grate areas is included.

Table VI.

Square feet of grate area (G)	T.U. utilized per sq. ft. of grate area per hour (E)
1—4	24,000
5—10	32,000
11—15	40,000
16—20	48,000

In case of direct heating, the total heat loss from the building per hour, divided by the proper value of E from column 2, will give the required grate area in square feet.

If the building is to be heated by indirect surface the conditions become practically the same as furnace heating and the computed heat loss by transmission and leakage must be multiplied by a factor to offset the heat required for ventilation, which, for the conditions of indirect steam, may be taken as 2.7.

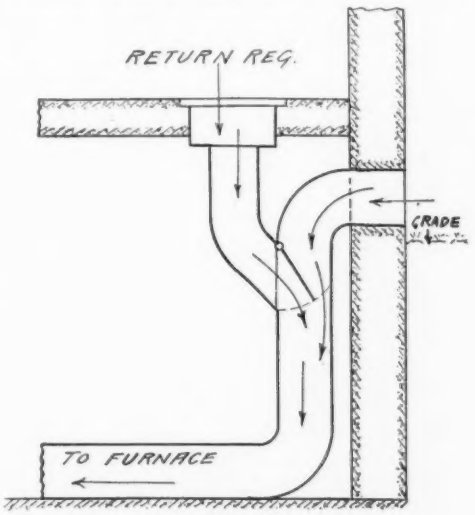


Figure 5.

When part of the rooms are heated by direct surface and part by indirect, the value of h must be computed for each room, those to be heated by indirect surface multiplied by 2.7, and the total divided by the proper value of E. Placing these rules in the form of equations, we have—

For direct surface, $G = \frac{H}{E}$;

For indirect surface, $G = \frac{H \times 2.7}{E}$

For part direct and part indirect surface, $G = \frac{h + (h' \times 2.7)}{E}$

in which

G = required grate area in square feet.

H = heat loss by conduction and leakage from entire building in coldest weather, in T. U. per hour.

h = total heat loss by conduction and leakage per hour from all rooms heated by direct surface.

h′ = total heat loss by conduction and leakage per hour from all rooms heated by indirect surface.

E = T. U. utilized per square foot of grate area per hour from Table VI.

For indirect hot water, use the factor 3 instead of 2.7 in the equations.

Example (4): A building is to be heated by a combination of direct and indirect steam. The computed value of h is 60,000 T. U. and of h′ 80,000 T. U. What should be the grate area of the boiler?

Solution:

$$G = \frac{60{,}000 + (80{,}000 \times 2.7)}{32{,}000}$$

= 8.6 sq. ft.

In designing a heating system for a dwelling house, the furnace or boiler should be so proportioned that fresh fuel will not have to be added oftener than once in 6 or 8 hours in the coldest weather. Assuming a combustion of 5 pounds of coal per square foot of grate per hour, or 40 pounds in 8 hours, it will require a depth of about 12 inches from the bottom of the fire door to the grate to give the necessary capacity. While the surface of the freshly fired coal may be carried 4 or 5 inches above the bottom of the door, there must be a like distance allowed at the bottom of the fire for the accumulation of ashes and cinder.

The cast-iron boilers commonly used for house heating are of two general types, those having a round grate, and the sectional boiler having a rectangular grate. The first of these is more frequently used for houses of small size, although both types have a considerable capacity range. Boilers for steam and water heating are practically the same, except the former are provided with a steam space above the water-line and are equipped with water glass and gauge cocks.

Sectional boilers are subdivided into those having steam and return drums and those in which the sections are joined directly together by nippies. When the latter type is used for steam, an outlet should be provided in every second section, in order to equalize the pressure within the boiler and maintain a stable water line. With this precaution there is no particular choice between the two types. When used for hot water a smaller number of outlets, of larger size, may be used if desired.

RADIATION.

The square feet of direct steam radiation necessary to heat a given room are found by dividing the heat loss h by 250. For indirect surface, multiply h by 2.7 and divide by 450. This is equivalent to computing the direct surface and increasing it 50 per cent., when indirect is used. Direct radiators, for the sizes commonly employed in dwelling house work, should not, in general, be over 32 inches in height, with perhaps 38 inches for the larger sizes, and two-column radiators are to be preferred to deeper ones, except in special cases, where the available space requires a different form. The location in ordinary sized rooms

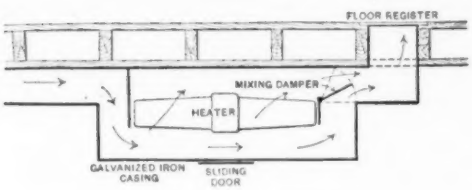


Figure 6.

should be governed largely by the desired furniture arrangement, as a radiator of the proper size should warm the room wherever placed. The matter of painting and bronzing should be under the direction of the architect rather than the steamfitter, and should be done in a manner to correspond with the general decoration of the rooms in which they are placed.

Pin radiators, 7 or 8 inches in depth, are commonly used for indirect steam heating. They are hung from the basement ceiling and enclosed in galvanized iron casings. The warm-air flues should be given a sectional area of 2 square inches for each square foot of heating surface, for first floor rooms, and 1½ square inches for second and third floor rooms. The cold-air duct should have an area very nearly the same as the total of the warm-air ducts connecting with the stack. Regulating dampers should be provided in each cold-air inlet and mixing dampers of the general form shown in Fig. 6 in the warm-air ducts.

STEAM PIPING.

What is known as the single-pipe relief system is especially adapted for supplying the direct radiation in dwelling houses. With this system there is only one valve to manipulate in connection with each radiator, and the number of risers passing through the first floor rooms is reduced by one-half. Indirect radiators require a separate supply and return connection to secure proper drainage, on account of their construction. A diagram showing the method of running the piping for a combined direct and indirect heating system is shown in Fig. 7. When possible, the return mains should be carried below the water level of the boiler in order to seal them as this arrangement produces a much

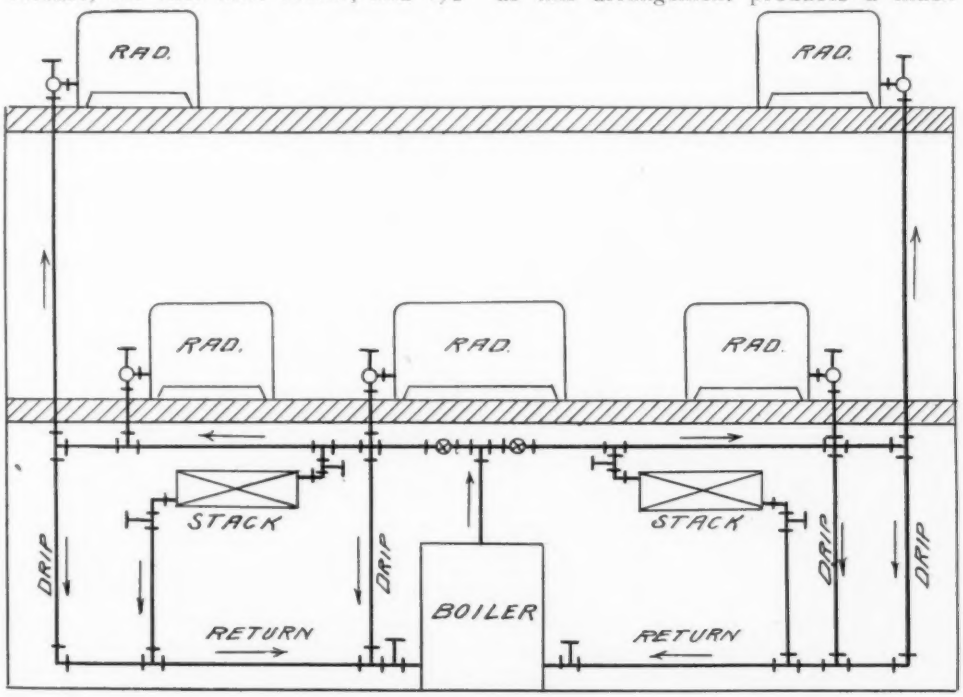


FIGURE 7.

quieter circulation and prevents water hammer.

Table VII gives sizes of supply and return pipes for the horizontal mains and branches for both direct and indirect radiation:

Table VII.

	Direct.		Indirect.	
Square feet of radiation.	Steam Pipe, inches.	Return Pipe, inches.	Steam Pipe, inches.	Return Pipe, inches.
60	1	1	1¼	1
120	1¼	1	1½	1¼
150	1½	1¼	2	1½
400	2	1½	2½	1½
800	2½	1½	3	2
1,200	3	2	3½	2½
1,800	3½	2½	4	2½
2,500	4	2½	5	3

In case of the vertical risers, where the steam and condensation flow in opposite directions, it is necessary to make the pipes somewhat larger, and Table VIII may be used.

Table VIII.

Square feet of direct radiation.	Size of riser, inches.
30	1
60	1¼
90	1½
150	2
250	2½

Care should be taken to carry up the risers in concealed positions, so far as possible, making use of hallways, closets,

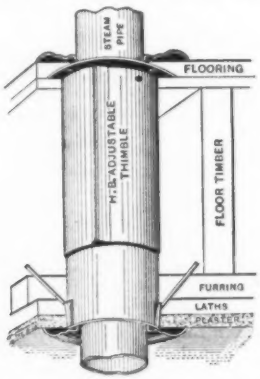


Figure 8.

and corners of rooms which are the least conspicuous. The runouts to the radiators are best concealed in the floor space which gives a much neater appearance. Where pipes pass through ceilings and partitions they should be protected with galvanized iron sleeves having a diameter from ¾ to 1 inch greater than the pipe. The sleeve should be adjustable as to length and the ceiling plate should be attached to the sleeve and not to the pipe as is commonly done. A sleeve with plates of this kind is shown in detail in Fig. 8.

DESIGNING HOT-WATER EQUIPMENT.

The method of computing the size of boiler for hot-water heating has already been described, and therefore requires no further mention.

RADIATION.

The square feet of direct hot-water radiation required for heating a given room are given by the expression $\frac{h}{170}$ and the indirect surface by $\frac{3\,h}{340}$, which maintains the same relation between direct and indirect surface as in the case of steam. What has already been said regarding both kinds of radiation applies equally well to water heating, the only difference in construction being to connect the tops of the sections also, in case of the direct radiators, and to provide a continuous downward passage from inlet to outlet in the indirect sections. Practically all hot-water radiation can be used for steam, but all steam radiation is not adapted to hot-water.

HOT-WATER PIPING.

A typical layout of supply and return piping for a direct hot-water system is shown in Fig. 9. In this arrangement the supply and return mains, which are of the same size, are run at the basement ceiling and the risers carried to the radiators above, as indicated.

The expansion tank is an important item in a hot-water system and should be connected in such a manner that it cannot, under any circumstances, be shut off from the rest of the piping. The method, sometimes employed, of connecting the expansion pipe with the house tank should not be allowed, it being much better to provide a special tank and keep the heating system entirely separate from the plumbing. The ex-

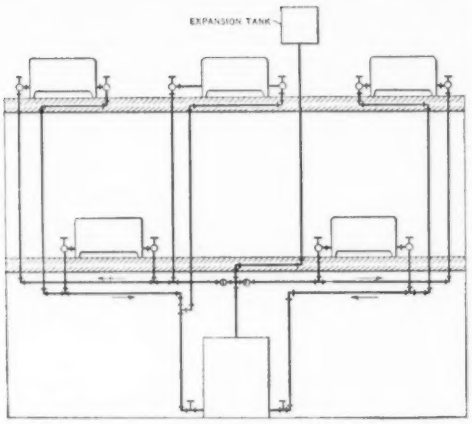


Figure 9.

pansion tank should be located where there can be no possible danger of freezing, and have connections for vent and overflow, in addition to the expansion pipe from the system (Fig. 10).

The capacity of the tank, in gallons, for any given case, may be found by dividing the square feet of radiating surface by 40.

When laying out a system of piping for hot-water heating care should be taken to favor the circulation through the first floor radiators. This is illustrated in Fig. 11, which shows a common method of making the connections where radiators on two or more floors are supplied from the same riser.

Another important matter is that of air venting. When the water in the boiler is heated, the air which it contains forms into small bubbles which rise to the highest points in the system and often accumulate in sufficient quantity to stop the circulation. In the arrangement shown in Fig. 9 the main and branches grade upward from the boiler so that the air which is not carried off by the expansion pipe finds its way into the radiators, from which it must be drawn off by means of air valves. As these, on a hot-water system, are more or less of a nuisance, they are often avoided by arranging the piping in a manner similar to that shown in Fig. 12. In this case a main riser first carries all of the water to the top of the building and the radiators are supplied on a downward feed through top connections. In this arrangement any air which is liberated in the system rises to the expansion tank and is discharged to the atmosphere through the vent.

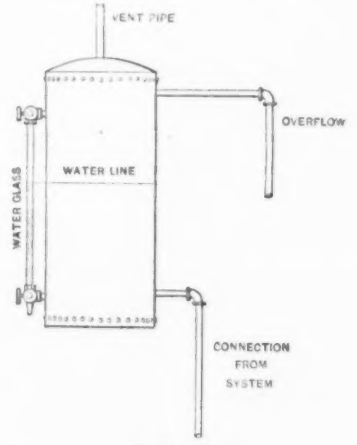


Figure 10.

Two methods of making the radiator

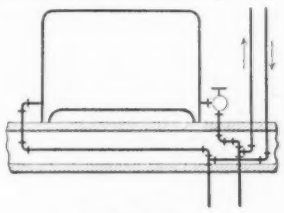


Figure 11.

connections are shown in this cut; those at the left being on the single-pipe system, and those at the right on the double-pipe system. Either of these will work satisfactorily when properly proportioned.

Pipe sizes for the lengths of run commonly found in dwelling house work are given in Table IX.

Table IX.

	Direct.		
Square feet of surface.	Mains and first floor risers	Second and third floor risers.	Indirect mains and connections.
30	1	¾	1¼
60	1¼	1	1½
100	1½	1¼	2
200	2	1½	2½
400	2½	2	3
600	3	2½	3½
900	3½		4
1,200	4		5
1,600	5		6

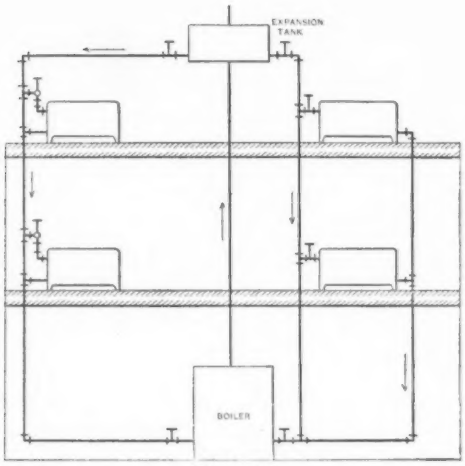


Figure 12.

GENERAL CONSIDERATIONS.

In obtaining bids for the heating of dwelling houses, uniform conditions should be insisted upon, and it is much more satisfactory in the end for the architect to prepare a fairly complete set of plans and specifications, covering the more important details of the equipment, than to allow each contractor to bid on his own layout. There may be, of course, exceptions to this in special cases, but in general, it is the fairest to all parties concerned to carry out the same scheme employed on larger work, except in simple form, and separate the engineering and contracting sides sufficiently to secure uniform bids from all parties.

When designing a system of heating, economy of operation should be considered as well as economy of installation, and this is difficult to obtain on competitive layouts. The objection is sometimes raised that contractors are not willing to guarantee results from plants not designed by themselves. As a matter of fact, the work should be so carefully planned that no guarantee will be necessary from any one. If a guarantee is insisted upon by the owner, contractors are usually willing to furnish one upon plans prepared by an architect, or at least, to state certain conditions upon which they will guarantee them.

The ordinary guarantee of sufficient capacity to heat the rooms to a temperature of 70 degrees in zero weather is rather indefinite, and a plant may fullfil this and still be far from satisfactory. Nothing is said as to the conditions of sunshine or cloudiness, strength of winds, quality of coal or frequency of firing, or whether the boiler must be forced to do its work or may be operated under normal and economical conditions. If a guarantee is to be called for, it should be sufficiently definite to have some actual value.

If competitive bids are obtained upon contractors' plans, the guarantees at least, should be uniform and complete. It seems to be the general opinion of those familiar with the matter, that all responsibility as to capacity should be assumed by those preparing the plans and specifications, and that the contractor should only be responsible for faithfully carrying these out and for the quality of his materials and workmanship.

As above stated, the usual guarantee calls for maintaining a certain inside temperature with a stated minimum outside temperature, and to this is generally added the steam pressure or water temperature to be carried in the radiators.

While the final test should always be made with the outside temperature as nearly that stated in the guarantee as possible, it often has to be carried on at one somewhat higher, and the question arises, what inside temperature should be maintained under these new conditions to indicate approximately the same capacity of plant. For cases of this kind, the following formula has been recommended by the American Society of Heating and Ventilating Engineers—

$$t = 70 + \frac{T - 70}{T}\, t^{o} \text{ in which}$$

t = inside temperature to be maintained.
T = temperature of steam or water in radiators,
t^{o} = outside temperature.

WHAT DO WE KNOW ABOUT LIGHTING?

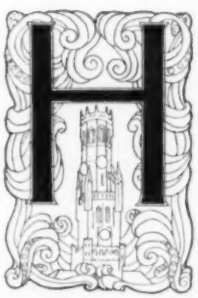
A STUDY THEORETICAL, SCIENTIFIC & PRACTICAL

By F. LAVRENT GODINEZ, Consulting Lighting Specialist

Photographs by August Patzig & Son

III.—ELEMENTS OF THE TECHNIQUE OF LIGHTING (Continued)

NOTE.—The purpose of this article is to illustrate certain axiomatic facts of an elementary nature bearing on light sources, distribution of light therefrom, and laws of reflection. Following these necessary preliminary studies it will be possible to direct a discriminating knowledge upon the physical and optic properties of illuminating glassware. Elementary as some points brought out here may seem, a thorough understanding of them is essential for the reason that they are involved in all questions of lighting. In addition to the exposition of more advanced and intricate principles of sources, reflection, diffusion, etc., etc., in other articles, the analytic study of specific installations will be taken up, as well as the design of fixtures, practically and esthetically considered, and should the interest of our readers warrant it, a study will be made of the lighting of specific types of buildings, such as schools, libraries, hospitals, banks, show-windows, factories, etc., etc., as well as street lighting and church and theatre lighting.—Editor.



AVING classified lighting glassware, under two general headings, we may now consider some of the properties of various glassware, of a translucent nature, when used in the form of partially enclosing shades. We have observed the effect of ground and opal glass, as an aid or hindrance to architectural expression, when used in the form of totally enclosing balls. Several inquiries have been made regarding the density of opal, and whether opal glass of very light density still possesses the property of diffusing light through the diffusing properties.

Fig. 1 shows an opal globe of very light density, over a tungsten lamp. The difference between the retina of the eye and the camera is, of course, great—the former being most sensitive to yellow light, and the latter practically insensitive to yellows or reds. To the normal eye the globe in Fig. 1, while revealing clearly the form of the light within, does so without the least annoyance to the eye, owing to the excellent diffusive characteristics of the glassware. Of course, opal of such light density is unsuitable, when appearance is to be considered, since the form of the lamp within is too apparent. Yet, at some distance, and with such glassware in panel format, in large lanterns, with considerable distance from the source of light to the glass—and with a frosted lamp, the effect is not so bad, and infinitely better than ground glass with its discordant and ugly spot effect. It should be noted that even light density opal, possesses the property of re-directing transmitted light, as described in our prevous article, where comparisons between opal, ground, and plain glass were described, based on miscroscopic examination.

Fig. 2 shows the effect of surface treatment by acid etching on opal glass, of the same density as Fig. 1. Acid, or sand-blasting has the effect of bringing out the body color of glass—giving "texture" or softness of tones, which

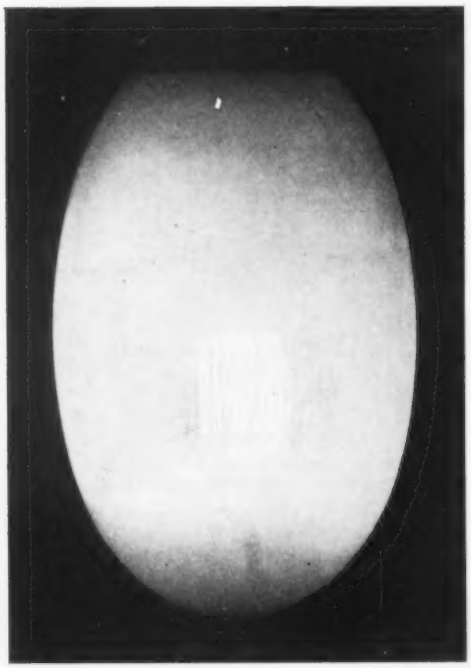


Figure 1.
Opal globe of very light density, yet giving excellent diffusion. The lamp filament within, however, is unpleasantly apparent.

gives exquisite depth and tints to colored glass of the most ordinary type.

Fig. 3 shows the effect of frosting a carbon filament incandescent lamp.

Fig. 4 shows the effect of frosting a tungsten filament lamp. The most important change is the reduction in brilliancy from 1,000 candle power per square inch to 5 c.-p. per square inch, or a decrease in intrinsic brilliancy of 1/200, which is practically the same source brightness as the oil lamp, and a tremendous relief to the eye. Regarding the loss of light—of no importance when compared with the physiological consideraton of eye comfort. The total quality of light is reduced less than 10 per cent. by frosting. The action of the acid on the surface of the glass in roughing it, was shown in our last issue, and it is evident that little or no change in direction of transmitted light is caused by the frosting. The frosting may be regarded as myriads of tiny crystals distributed so that while they allow light to pass without greatly changing its direction, but some light rays from the filament are reflected back and forth within the bulb. The absorption of frosted glass varies, owing to the variations in dipping lamps, and various strengths of acid solutions—generally consisting of hydrofluoric acid and ammonium carbonate, but it seldom exceeds 7 per cent.

Frosting does not affect the life of a tungsten lamp, but the drop in candle power, after continued use, is more marked. In other words, the candle power of a frosted lamp is reduced to about half that of a clear lamp after 500 hours' burning. Some lamp manufacturers are to be congratulated for their policy of using frosted lamps in public exhibitions devoted to the electrical industry.

Figure 2.
Shows the effect of surface treatment by acid etching. Note that the lamp filament is entirely concealed.

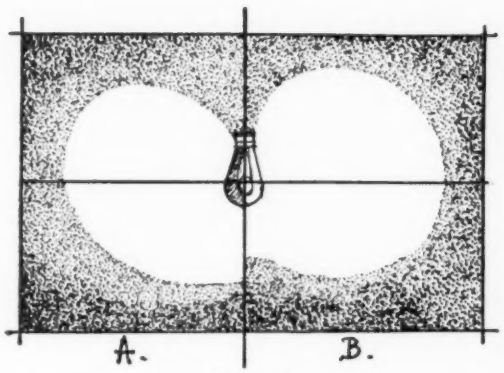


Figure 3.
(A) Light about carbon filament lamp, frosted glass, unshaded.
(B) Light about same lamp, clear glass, unshaded.

When a shade is used, which exposes only the tip of a lamp, the tip should always be frosted. Clear bulbs must only be used when the lamps are entirely concealed, in such applications as display window, and indirect lighting. In the latter case, a frosted lamp tip pointed skyward acts as an excellent dirt collector and cannot be readily cleaned, but with lamps hanging pendant tip, or "bowl-frosted" lamps should always be used. It is then the surface of the reflector which acts as a depository for "matter out of place" and its cleanliness depends on its freedom from mountainous ridges, with dirt inviting valleys in between. Naturally, we do not desire to restrict the surface ornamentation of shades used for commercial applications, but when such ornamentation is in bas relief it must be ornamental—not ugly and devoid of suggestion. In opal glass every manufacturer has a medium lending itself readily to any surface design. A really artistic bas relief effect is more often enhanced and emphasized by a settlement of dirt, whereas an ugly surface becomes the more conspicuous. The more attractive the exterior of a shade, in harmony with its surroundings, the greater necessity for making its interior as inconspicuous as possible.

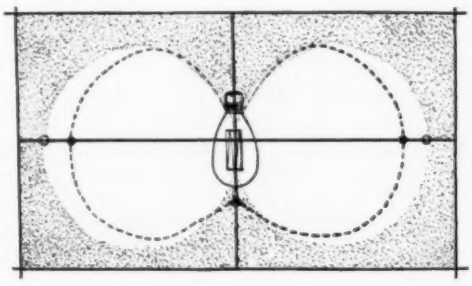


Figure 4.
The dotted line indicates the change of light distribution by frosting a tungsten lamp.

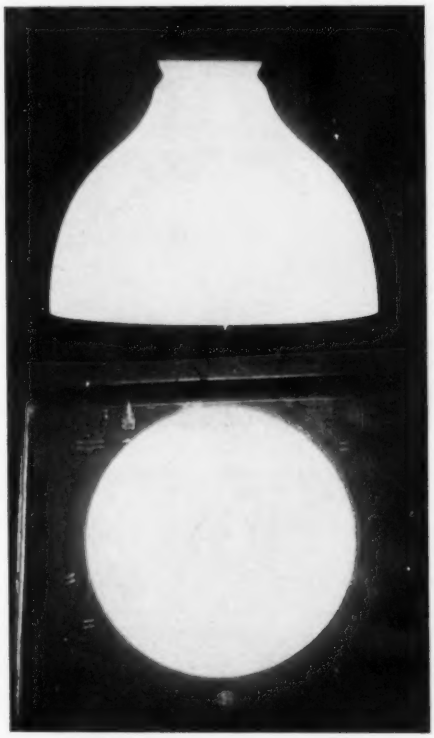


Figure 5.
Glare from polished inner surface of an opal shade.

Fig. 5 represents an ordinary opal shade, of light density, without surface design. Beneath is a mirror showing the inner shade surface, which is highly polished. It is impossible to look within any polished shade without experiencing intense ocular discomfort, and I have alluded to the mirror-like fidelity with which polished surfaces of furniture and papers reproduce these glaring images. Fig. 6 shows an ordinary opal shade with an original polished inner surface,

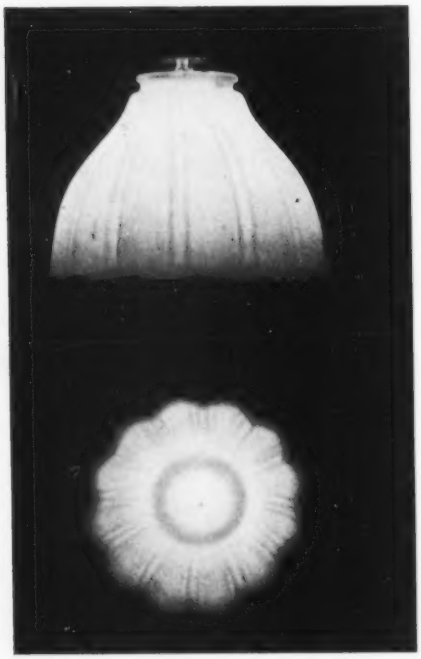


Figure 6.
Absence of glare from the depolished inner surface of an opal shade.

which has been depolished by acid etching. The soft distribution of light, so pleasing to the eye, is marked. Every glass manufacturer in the country can produce shades with depolished inner surfaces upon request. Those who have experienced the rare delight of gazing upward from the barber's chair into the glaring shade will understand. It is of interest to note whether this relief to the eye, by simply depolishing glassware, can be attained without any great loss of light. Fig. 7 shows the distribution of light from an ordinary prism shade, and the dotted line indicated the change caused by depolishing the inner surface with acid. The difference in distribution and quantity of light is comparatively insignificant, since only the ribs, or prisms on the outer surface of the glass are affected by the inner treatment, which owing to its diffusive action prevents many light rays from entering the prisms by surface redirection, and affect those which do pass through the prism by absorption of the inner surface roughing. From a physiological viewpoint there is no comparison, the depolished inner surface being much softer and marred only by the bright lines, or streaks, which are characteristic of the prism glass. While the surface of such glassware cannot be modified to conform with architectural expression, owing to its necessary ribbed effect and lack of color, these shades can often be concealed within artistic outer forms in certain applications. They may best be used when entirely concealed within large fixtures, so that their inner reflecting surfaces may be left polished, and their distribution of light not altered by inner surface treatment, as described.

In all applications of shades one must consider the desirability of having more, or less, light transmitted *through* the shade, upwards. It is not difficult to derive useful, approximate figures showing the utilization of light above and below the horizontal, *up*, through the shade (transmitted light) and *down*, from the inner surface of the shade,—diffused or reflected light. Simply by placing a white card above, and below a shade,—equally distant from it, one can see by the intensity of light on a

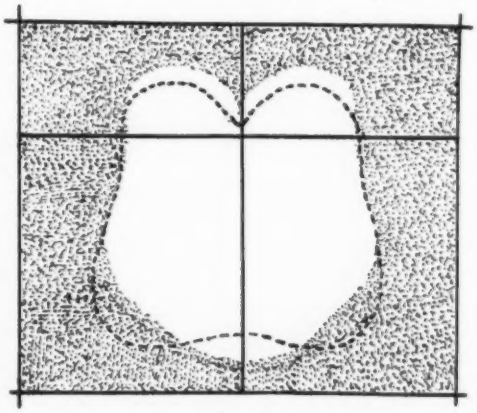
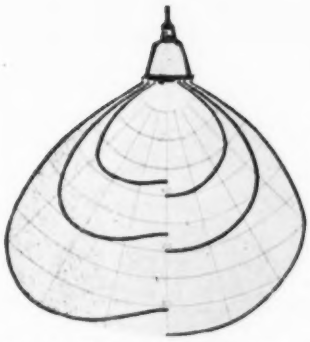
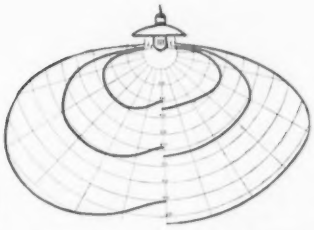


Figure 7.
The distribution of light from a prism shade. The dotted line shows the change of distribution caused by depolishing the inner surface.

card whether equal light obtains. A small card must be used, so that its surface area will not be great enough to increase the brightness of the other card by its own diffusive action,—if held parallel to it. Reverting to Fig. 7, the

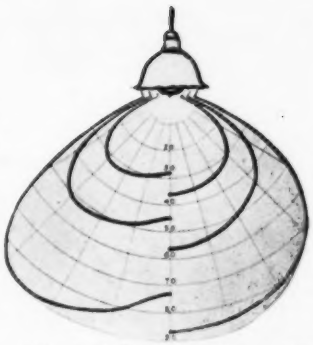


(1) A narrow shade of dense opal glass, depolished.



In these three diagrams the curves show light distribution (left) from clear lamps and (right) from frosted tip lamps.

(2) A semi-flat dense opal shade, depolished.



(3) A bell-shaped dense opal shade, depolished.

utilization of light is 34.3 per cent. above and 67.7 per cent. below the horizontal, with the clear prism shade giving the distribution shown by the white area.

With the inner surface depolished by acid treatment (area enclosed by broken line) 39.2 per cent. of light is transmitted, above the horizontal, and 60.8 per cent. diffused below. Now, for a practical application, consider for a moment Fig. 8. The glass panels of the lantern are so placed that even opal glass could not assist in giving re-direction by transmitted light, since there is not sufficient inclination of the lantern sides to give this re-direction. If the panels came to a point below the lantern, forming an inverted cone, then the slope of their sides—if formed of opal glass would give a downward direction to light transmitted (Fig. 4, p. 370, April issue). With *ground glass* panels, and one or more light sources, centrally placed within, the distribution of light would be all on the horizontal, bringing out the balcony rail, but leaving a strata of darkness on the ceiling and floor above and below. This application, however, is one of the few exceptions where ground glass can be used without its characteristic spot-like effect by placing a reflector within the upper recess of the lantern, where there is considerable space. By placing a reflector therein, with a large sized tungsten lamp, entirely within its reflecting surface, the re-direction of light by the reflector is not changed by the action of the ground glass, and the lamp itself is so far above the ground glass panels that the spot light effect is eliminated. A circular disk of amber gelatine film, stretched between two flat iron washers, and placed directly below the lamp,—(attached to the reflector rim) gives to the tungsten lamp the necessary color modification, so desirable when rich warm tones of brown, amber and gold predominate in decoration. Since the top of this lantern, like many of its kind, is opaque, a prism *shade*, such as described in Fig. 7,—which allows considerable light to pass upwards—would be unsuitable and a wasteful use of light. An opaque *reflector*, allowing no

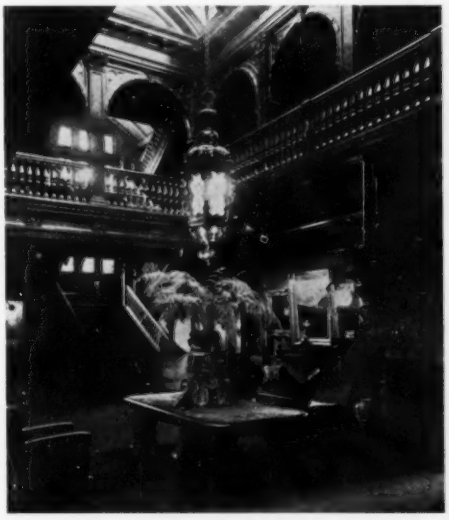


Figure 8.
Treatment of a lantern for modification of color distribution and pictorial effect.

Figure 9.
Modification of lighting brings out the character of the bowl—the natural veining of the alabaster.

Figure 10.
The same bowl, with all its expression destroyed by over-lighting.

transmitted light above, would be more suitable, with a reflecting surface of permanent and high reflecting power (to be later described with other opaque reflectors of its kind). In this instance, when both lamp and reflecting surface are entirely concealed from view, such a polished inner reflecting surface meets both physiological and architectural requirements.

Very often other than plain glass is required in such applications. When

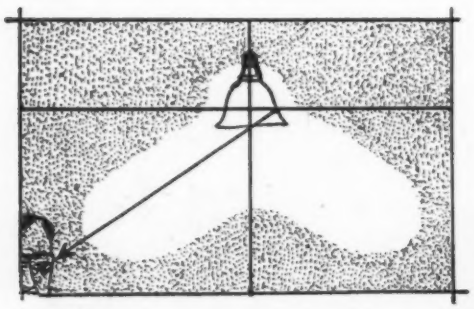


Figure 11.
Undesirable distribution with polished inner-surface shade of any kind of glass. Here the reflected light strikes the eye, but depolishing effects diffusion.

the glass used is of such beautiful nature as to possess individual appeal, the problem of placing our light source therein becomes further involved, it being often necessary to use just enough light to properly convey the pictorial value of the lantern, with due regard for the beauty of its glass. To illustrate this point Fig. 9 shows an alabaster bowl properly lighted to bring out its beautiful expression by a single lamp, vertically and centrally placed. Fig. 10 depicts the same bowl with its expression absolutely ruined by over lighting,—the usual senseless arrangement of a cluster of lamps prevailing. This question of lighting bowls to bring out their pictorial value, and at the same time obtaining such utilization of light and color, as is demanded by architectural expression, must be treated individually with the subject of indirect lighting, when we have finished with fundamentals.

In such a lantern as described, a reflector giving a distribution of light as shown in Fig. 11 would be suitable, and ground glass panels would not change

Figure 12.
Illustration of the natural function of the eyebrow in protecting the eye, even when, as here, the light is wrongly placed and the reader in wrong position.

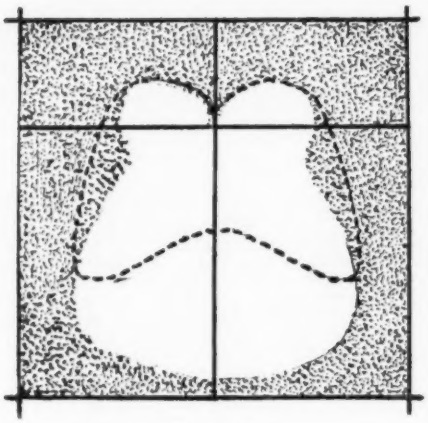


Figure 13.
Loss of light by placing lamp too low in a polished shade. A long, instead of a short, holder should be used with tungsten lamps over 40 watts.

the direction,—only modifying it by absorption. The associated diagram is intended to show how sharply reflected rays of light, at certain angles, are reflected directly into the eyes, and why shades with polished inner surfaces, shaped so as to give such wide distributions of light when exposed to view are undesirable. When a shade has more of a downward distribution, as shown in Fig. 22, page 377 (April issue), no matter where persons are seated in a room, their eyebrows intercept even direct reflected rays from concentrating, polished inner-surface reflectors. This function of the eyebrow in shading the eye is shown in Fig. 12 (Id—Fig. 6), where a person is seated in an incorrect reading position, facing the light, the protection being quite accidental.

Very often lamps are placed too low in shades, yet without projecting below them, causing unsatisfactory modifications of light. Sometimes a small lamp is placed in a shade intended for a large lamp. In this case the small lamp is so high up within the shade, that its light is either reflected back and forth aimlessly with considerable loss, or else concentrated in a spot of light, depending, respectively, on the slope of the shade's sides. For example, a light-radiating surface, or lamp filament, two inches long, within a cylinder of a dense opal glass, 8 inches deep, could not reflect any useful light below the horizontal, since its light could only escape by transmission *through* the glass. What would happen with a cone, or umbrella shaped shade has been described on page 377, Fig. 22 (April issue). Even with lamps and shades of the right size, if the proper shade holder is not used, most unsatisfactory distributions of light will obtain. In Fig. 13 the distribution of light about a prism shade, deep enough to completely cover the light radiating surface (lamp filament) with a re-directing surface (shade interior) is shown by the white area. With over 40 watt tungsten lamps with skirted bases, deep shade holders must be used to give this correct position. The broken line shows the loss of light by using a flat shade holder, forcing the lamp in a lower position. This loss with a depolished inner shade surface would not be so marked, which is another very good reason, aside from physiological considerations, why shades with depolished inner surfaces are desirable. But with a polished inner surface, any *slight change* in position of the light radiating surface,—whether it be a gas mantle or a tungsten filament—will produce decided changes in light distribution. Hence the continued changes in position of filaments by tungsten lamp manufacturers as a result of their various improvements in lamp efficiency cause decided modifications in distribution of light, when these lamps are placed within shades with polished inner surfaces.

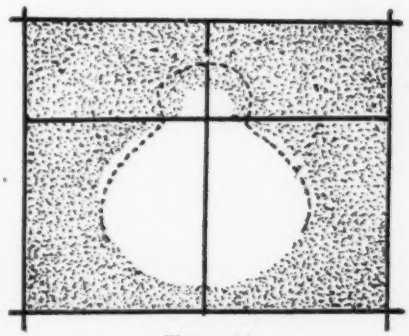


Figure 14.
Light from dense and light opal shades compared. The white area shows the light from dense opal shade; the dotted line, the light from light opal.

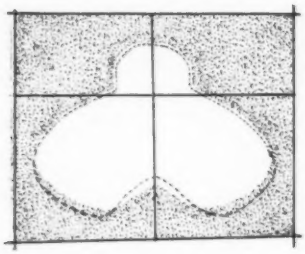


Figure 15.

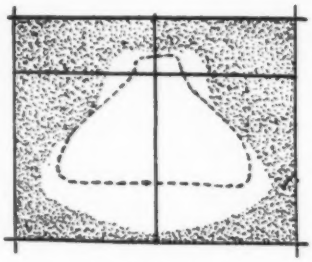


Figure 16.

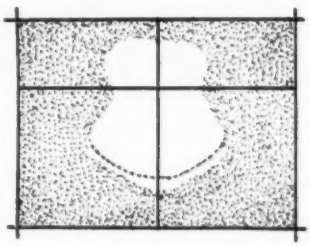


Figure 17.

Figure 15. Light from a white flaked opal glass shade with partially depolished inner surface (white area). That this rough and smooth surface gives both diffusion and reflection is proved by the dotted line, showing slight modification caused by depolishing inner surface.
Figure 16. A comparison of opal flaked glass (dotted line) and dense opal glass (white area) used in shades.
Figure 17. A comparison of cloudy flaked opal glass (white area) and plain opal glass treated on outer and inner surfaces (dotted line).

There are many opal shades available from all glass makers of standing. These are supplied in moulded (heavy thick glass) or blown (light thick glass). Both styles are usually furnished with a polished inner surface, being depolished only when so ordered. The best dead finish is obtained by first sand-blasting the inner surface, and then applying acid to eliminate the too irregular, dirt collecting surface. This gives a soft, velvet-like texture to the glass. Naturally, a thin, blown opal glass allows a greater transmission of light above the horizontal — through the shade. One might assume, then, that there would be less light diffused downward, below the horizontal.

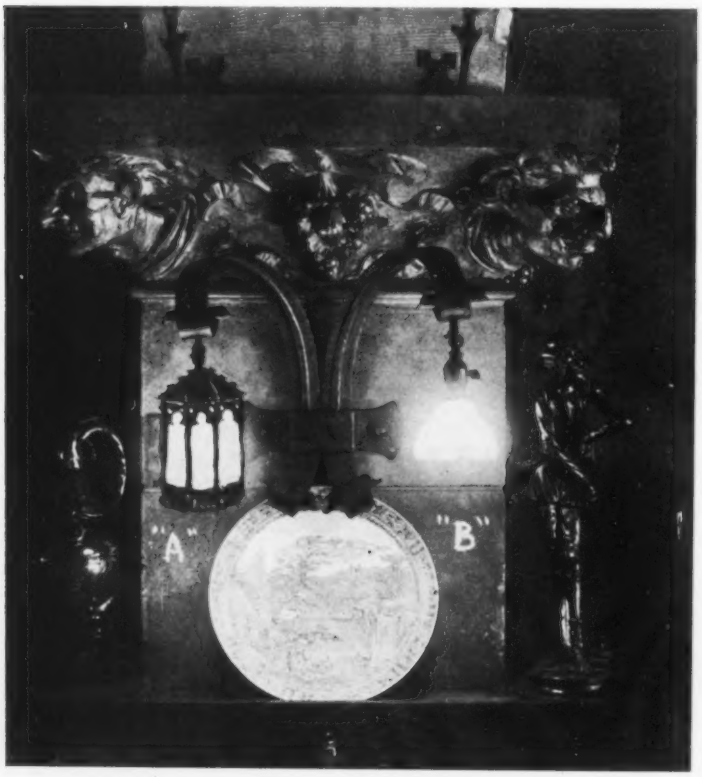


FIGURE 18.
"A"—Suggestion for Gothic lantern to conform with brackets, etc.
"B"—The incongruity and glare of the shade actually used.

In Fig. 14 the white area shows the distribution of light about a bell shaped, dense (moulded) opal inner depolished shade, over a tungsten lamp. The light transmitted above is 20 per cent.—diffused below 80 per cent. The broken line represents the distribution of light about a light (blown) opal, bell-shaped shade, of exactly the same shape as the dense, and with the same lamp in the same position, also with an inner depolished shade surface. The

transmitted light above the horizontal is 33.4 per cent. and the diffused light below 66.6 per cent. The candle power at a point directly below the lamp tip is the same for both shades. These opal shades are recognized by their amber color and over-familiar "Sheffield" design, which is becoming almost as commonplace as the ribbed, prism effect. As I have previously remarked, there is no restriction whatsoever limiting in expression and character of the treatment of shades rendered in opal glass. Any design can be cut in the mould so that it will appear on the glass in bas relief,—the added thickness of the glass giving increased absorption, and bringing out the ornamentation decisively, against a rich, warm, background. In amber this glass affords a pleasing relief from the monotonous white globes, which are often unpleasantly conspicuous, against dark backgrounds and which deprive yellows, golds and browns of all their depth and warmth. Direct the light from a tungsten lamp (unshaded) against a piece of Mission furniture, or an embroidered cloth, embellished with gold. Then place over the lamp a piece of amber gelatine film, or amber glass, and note the transformation. In light rooms, with the white backgrounds, which prevail in many commercial interiors, the white shades of opal blend quite inconspicuously with their environment. They are also moulded, or blown,—the former having in some instances flakes, or splotches, quite visible within the structure of the glass. These have recently been practically eliminated by manufacturers. One of the peculiarities of this white, dense, opal glass is that its inner surface re-directs light, both by reflection and diffusion. That is, it is partially depolished. One may observe a slight glaze in spots, on its inner surface, proving that some rays of light are reflected directly into the eye, but that this surface really gives reflection and diffusion is proven when it is depolished and compared. In Fig. 15 this very slight modification is shown. Fig. 16 shows a comparison of a dense amber opal shade (depolished) with a white opal shade as above described, using the same inverted, incandescent gas mantle with both shades. The white area shows the distribution effected by the dense (moulded) amber shade,

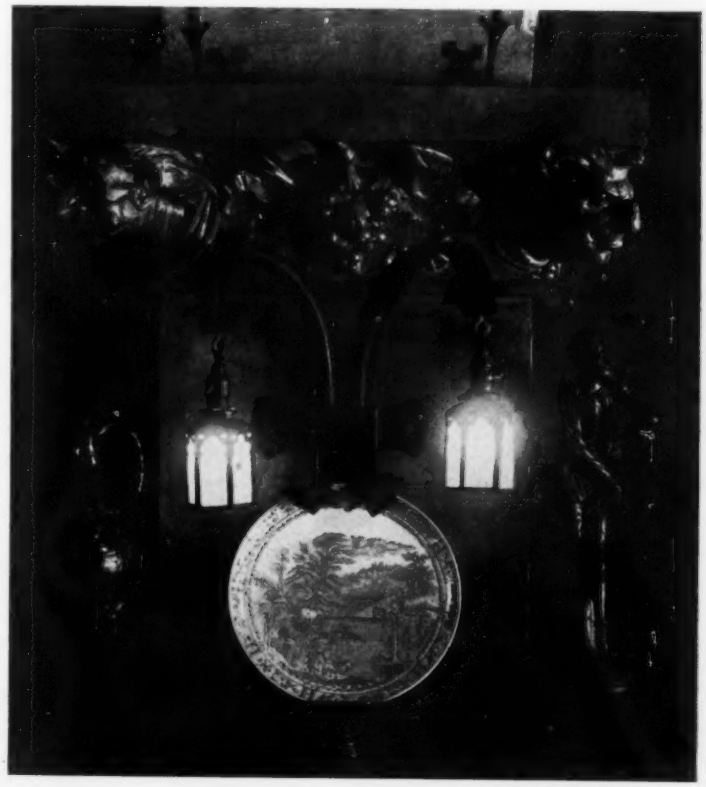


FIGURE 19.
The detrimental "spotty" effect of light from lanterns glazed with glass which is too translucent (see page 468).

Figure 20.
Bad lighting of buffé cabinet by tubular lamp. Woodwork should be depolished, lamps spaced further apart and concealed. Note glare from lamp on side wall fixture, also shown in Figure 18 "B."

giving a transmission of 21.2 per cent. above the horizontal, and a diffusion of 78.8 below the horizontal. The white opal (moulded) shade, with a less homogeneous suspension of suspended particles of opal within the structure of the glass (broken line) gives a transmission of 31.3 per cent. above the horizontal and 68.7 per cent. below.

All of these shades are of about the same shape, as is indicated by the similarity in their distribution of light. Still another shade of white opal glass is different from those described in that both its inner and outer surfaces are surface treated with acid and sand. This glass is characterized by an exquisite texture and softness, being exceedingly soothing to the eye, but unfortunately its roughened inner and outer surfaces, like prism glass, readily collects dirt, which is eradicated only with painstaking labor. Therefore, as a rule, it remains dirty.

Fig. 17 shows how this glass modifies light distribution (the broken lines) showing the difference of its effect from that of the other dense white opal-moulded-glass, without surface treatment. That this double surface-treated glass gives a transmission scrupulously clean is a beautiful delusion to cherish, but, alas, a vain one. This is why "scientific" illumination, with its often absurd theoretical efficiencies, and disregard for depreciation—the effect of dirt—falling off in light with lamp life—has resulted in much dissatisfaction, the burden of which has rested heavily on the Public Utility Corporation. In commercial applications the best shade, from a purely utilitarian viewpoint, is the one which maintains a distribution

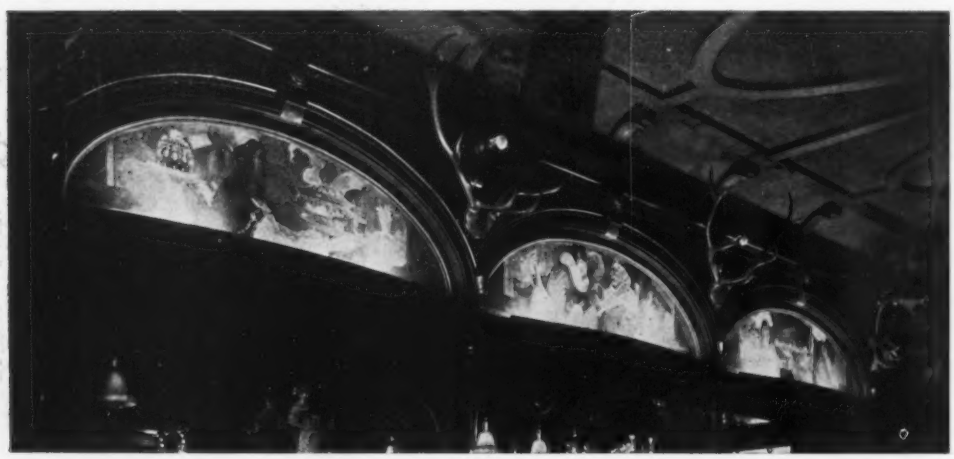
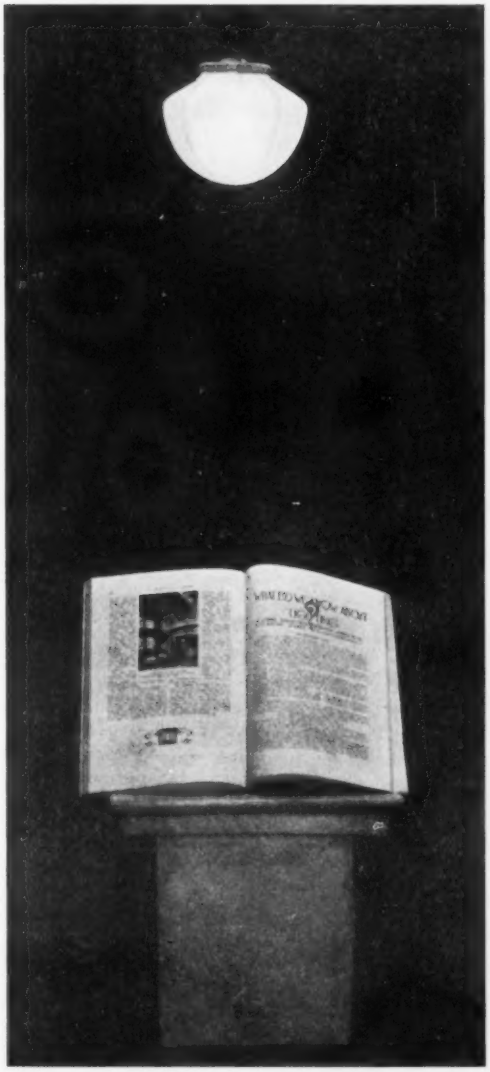
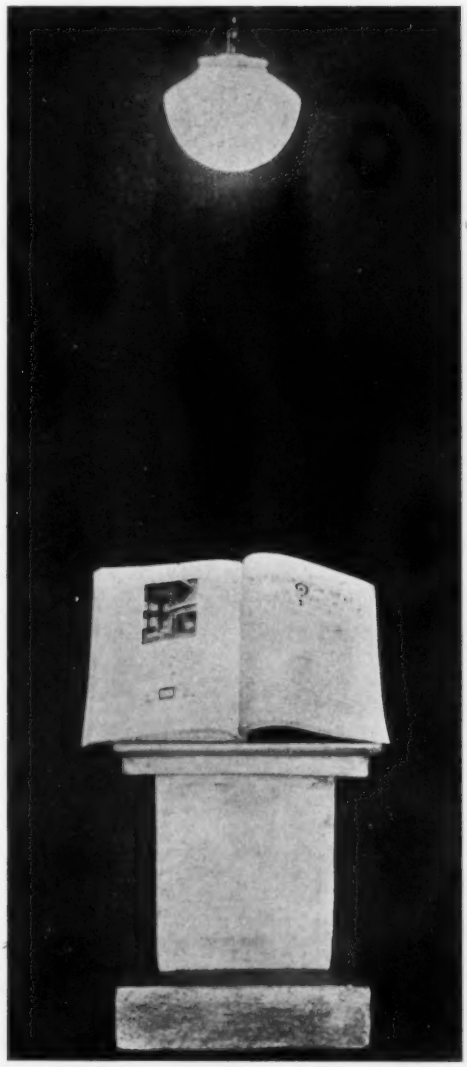


FIGURE 21.
"Spotty" lighting of mural panels—a condition to be corrected by a use of reflectors, to be described later.



Photograph showing the modification of the distribution and increase of light below by the re-directive property of opal glass.

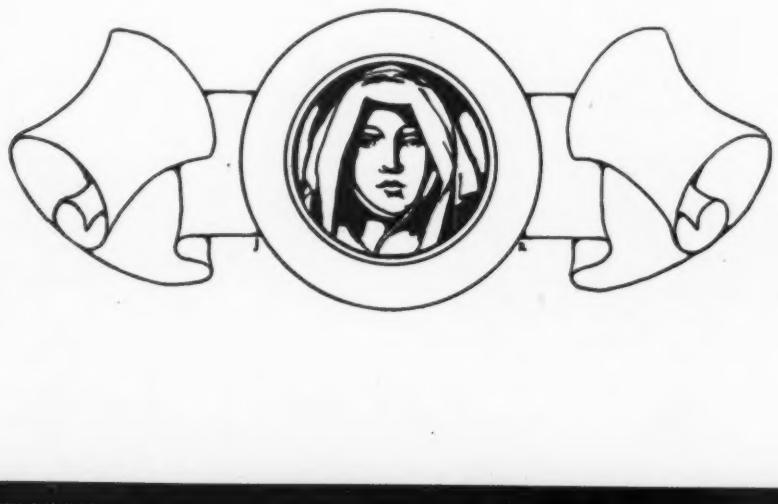


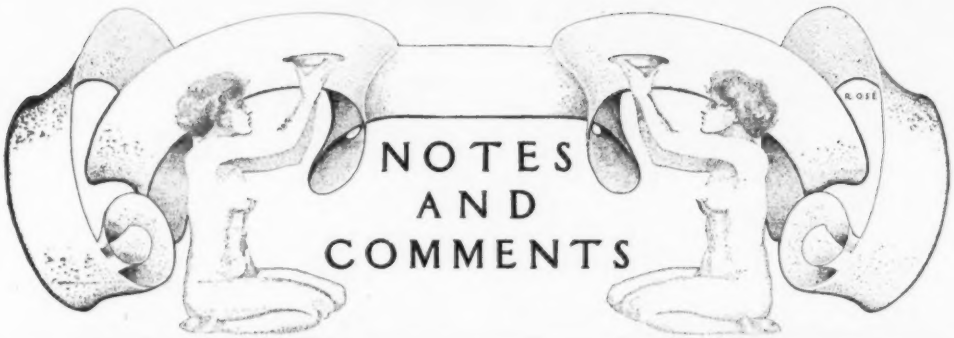
Photograph showing modification of distribution and loss of light below from a ground-glass globe.

of light below the horizontal, unaffected by the deposition of dust on its outer surface, and not dependent on a white ceiling, which may not stay white indefinitely. While all sorts of grotesque ideas have been advanced concerning the effect, or non-effect, of outer surface dirt on inner surface reflection, no one can dispute that dirt on the outer surface of a shade must greatly diminish the quantity of transmitted light toward the ceiling. Again, in the many commercial applications, dirty, dingy ceilings cluttered with ugly piping, outlets, and fire nozzles, are not improved by searching light which feature them as distraction factors. As a concrete example, relating to shades and their misuse, regard Fig. 18. Here there has been an evident and otherwise well carried out intention of creating a certain architectural "atmosphere"—a flavor of

the Mediaeval Gothic style of Germany which is expressed throughout this restaurant.

This shade is absolutely incongruous with its fixture and its environment. It is of the dense white opal type described, allowing almost as much light to pass above as below, and both diffuses and reflects light from an inner surface, which is neither polished, nor depolished. The ceiling in this interesting room is a wonderful gold, which is not improved by the white light directed upon it. In restaurants, where architectural expression prevails, and the ceiling itself is of interest, do not forget that the white table tops diffuse a great amount of light upward on the ceiling, from the reflectors hanging above them. Being white they reflect somewhat the color of the incident light. This interior is rich in the period expression of the 15th century—all should be mellow, soft, and suggestive. Browns and gold predominate—a white light effect prevails which ruins the pictorial value of the room. On looking about at the interesting panelling, the paintings and other unique features of the room, the eye encounters the white splotches of light dangling miserably from the quaint old wrought-iron fixtures. Obviously a Gothic lantern in place of these commercial shades, seen everywhere, would be quite apropos. Unfortunately the selection was made of such a lantern in a glass, which, while amber in color, is too translucent and like ground glass "spotty"—this effect is shown in Fig. 19. Obviously the appearance of the fixture is greatly improved, but there are other considerations. The glass in the lantern shown in Fig. 19, like ground glass, gives no redirection of light. Hence their effect is a splash of light against the wall, destroying the pictorial value of the lantern. The solution of the problem is quite simple, a dense cylinder of opal glass of amber color is placed over the shade, as shown in Fig. 18-B, a stamped metal frame with a base, carrying out the idea of a real lantern, is dropped over the cylinder, clamped to the shade rim being suspended from the socket. A strip of gelatine amber film in the base of the lantern gives a pleasing modification of the light directed down on the table cloth, which in turn diffuse the color upwards on the ceiling and about the room. This is an instance where dense amber opal shades might be used to advantage, since only enough transmitted light is desired to give color to the lantern glass, and preserve its pictorial value, the table cloths serving admirably to bring out the gold of the ceiling, and acting in the capacity of an indirect lighting system upside down. As the function of the legitimate lighting specialist is to take conditions as he finds them, and not force the sale of glass and globes, these same shades, as illustrated in Fig. 19 will be utilized, and concealed within the lanterns. In this quaint and original old German tavern there are unlimited possibilities to use light as an artist does his brush, in giving a pleasing suggestion of atmosphere here and there. Such problems as are of exceptional interest will be presented with the regular subject matter as we progress.





Henry W. Desmond

Henry W. Desmond, formerly editor of The Architectural Record, and identified with affiliated publications, died at his home in Cranford, N. J., on March 18th, at the age of fifty. Mr. Desmond, before the illness which caused him to retire about four years ago, was a man of remarkable activity and versatility. In addition to his work as the editor of The Architectural Record from its beginning as a quarterly in 1891, he found time to edit a number of books on technical subjects, to write fiction, and to experiment extensively in chemistry, photography and processes of photo-engraving.

In New York City Mr. Desmond was a member of the National Arts, the Century, the City and the Faculty Clubs, which represented, in a measure, his wide interests and ready social inclinations.

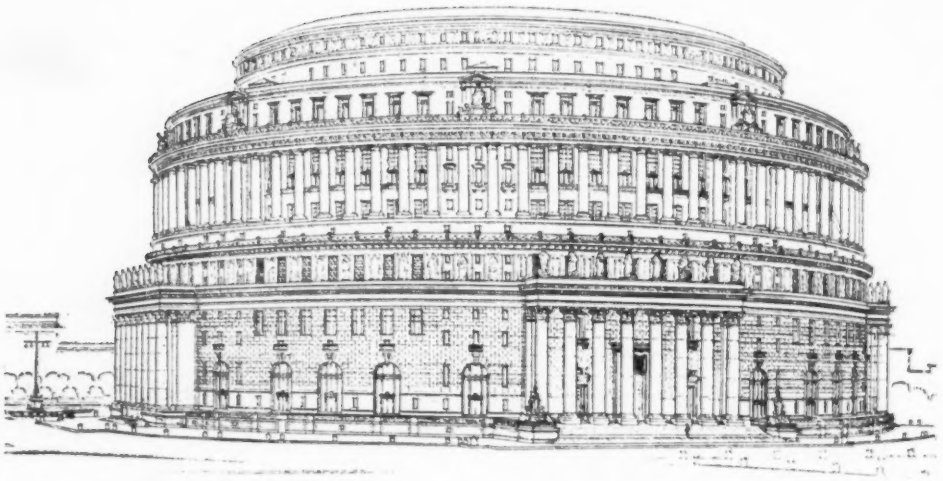
In an appreciation of Mr. Desmond's editorial work on The Architectural Record, Montgomery Schuyler writes: "In the beginning Mr. Desmond had no special competency, in aptitude or training, for the editorship of an architectural periodical. He was a man of letters, a maker of graceful verse and a vigorous prose writer. But he was a man of quick intelligence, improved by education; and he came near exemplifying Dr. Johnson's definition of genius as 'a mind of large general powers, accidentally determined to some particular direction.' In the publications under his editorial charge he set high standards.

THE LATE HENRY W. DESMOND.

The Court House Award.

The award of the competition for the County Court House in New York to Guy Lowell, of Boston, is a matter of newspaper chronicle, but the design is one which must have an extraordinary architectural significance. Mr. Lowell's design is without precedent in the public or monumental buildings of this country. It presents unusual qualities of architectural classic dignity. Space does not permit detailed description of the scheme, which it is hoped opportunity will afford to treat of in detail later, but occasion is here taken to congratulate the architect, and to print the report of the Jury of Award to the Court House Board, as follows:

"Gentlemen: The jury for the competition for the selection of an architect for the Court House reports as follows in the matter of the final stage of that competition:



A PERSPECTIVE DRAWING OF THE WINNING DESIGN FOR THE NEW YORK COUNTY COURT HOUSE.
Guy Lowell, Architect.
The plans call for a building 500 feet in diameter and 200 feet in height.

"1. Pursuant to your instructions, the jury met at the offices of your board, 115 Broadway, New York, at 10 a. m. Monday, April 7, 1913.

"2. The jury has devoted to its duties the whole of four consecutive days, having held in all eight sessions.

"3. The jury found twenty-two sets of drawings hung for its inspection in the offices of your board. The arrangements were such that privacy was perfectly preserved, no one being present at any time except the jury and a single attendant.

"4. The jury at its earlier sessions examined each design with care, and it has repeatedly re-examined each design.

"5. In arriving at its decision the jury has taken into consideration the varied requirements of the programme, and in accordance with Article 10 of the programme the jury has selected the design numbered three (3) as the most meritorious, and hereby so designates it.

"6. This design fulfills to an unusual degree the exacting conditions of the programme. It presents an exterior of high dignity and interest. It gives evidence of great architectural ability on the part of its author. It promises a public monument in every way worthy of the City of New York. Respectfully submitted,

"ROBERT S. PEABODY,
"FRANK MILES DAY,
"JOHN LAWRENCE MAURAN."

This verdict was accepted unanimously by the board. Mr. Lowell said yesterday that he thought the building could be erected within two years of the completion of the foundations. The cost of the building is likely to be $10,000,000, and of the site, $6,000,000.

Note should be made in passing of one stupid newspaper article whose author is evidently in amazing ignorance of the aims and standing of the American Institute of Architects. The headlines of the article in question, from a Brooklyn paper, are interesting: "Architects' Trust Forces Big Fees; Guy Lowell to Receive $600,000 for New Court House in Manhattan: Cheaper in Brooklyn, etc." Certainly it is to be hoped, for the cause of architecture, that it may not become customary for municipalities to "shop around" for plans of proposed civic improvements. It is obvious that they can secure architectural services at less than the six per cent. stipulated by the American Institute, but the Institute schedule is based on a very simple hypothesis, and is designed to insure the maintenance of only a high standard of work among its members—an architect cannot, from the exacting nature of his work, achieve the best results on a smaller commission. He earns six per cent., and in many cases may be said to earn much more. Nothing can be more stupid or wide of the mark than to attempt by state-

ments or insinuation to liken the American Institute of Architects to a "trust" or to imply that its members exercise their membership for "restraint of trade." Architecture is a profession—not a trade, which alone must explode the "trust" similie, and the aims of the Institute are centered only in the furtherance of higher aims and ideals for architecture in this country.

The Fifth City Planning Conference.

The Fifth National Conference on City Planning will be held in Chicago on Monday, Tuesday and Wednesday, May 5th to 7th. Members and guests will convene for luncheon at the Hotel La Salle at 12:30, spending the afternoon in a motor tour of the city. In the evening Frederick Law Olmstead will speak on "A City Planning Program," taking up (1) the development of a city planning movement, (2) the principal steps in the preparation of a city plan, and (3) methods of putting a city plan into execution. The conference will include a number of other interesting and valuable lectures and reports, including "German Methods of Paying for Improvements Out of Excess Land Purchases," by Dr. Werner Hegeman, of Berlin. The conference is indicative of the growing attention being given in this country to civic projects in terms of practical execution.

School Hygiene.

There is now being arranged at Buffalo a comprehensive program of papers and discussions covering the entire field of school hygiene. There will be scientific exhibits, representing the best that is being done in school hygiene, as well as commercial exhibits of practical and educational value to school people. Nor will the entertainment of the delegates be a minor feature, for plans are being made for a series of social events, including receptions and a grand ball, a pageant in the park, and excursion trips to the great industrial plants at Buffalo, as well as to Niagara Falls and the Rapids. Buffalo has just taken up a collection of $40,000 for the purpose of covering the expense of the Congress.

Delegates will attend from all the leading nations, from every college and university of note in this country, and from various other educational, scientific, medical and hygienic institutions and organizations. The Congress is further open to all persons interested in school hygiene. Membership may be secured on the payment of a five-dollar fee. Applications should be sent to Dr. Thomas A. Storey, College of the City of New York, New York City.

The man of to-morrow depends upon the child of to-day, and the child of to-day, roughly speaking, spends half his waking hours under the influence of school conditions. Those who are interested in making those conditions what they ought to be will undoubtedly find much to interest them in this convention, which will be held in Buffalo from August 25th to 30th, inclusive.

News from Australia.

Rather curiously there came, almost coincidentally, to the United States last month the tidings that the new capital of the commonwealth of Australia had been christened Canberra, after long discussion; that the foundation stone of the capitol building had been laid with imposing ceremonies; and that the premiated design for the city, which was made by the young American architect, Walter Burley Griffin of Chicago, had been abandoned in favor of a sort of compromise plan worked out by a local Departmental Board. It is explained that the Board studied the various prize winning designs on the contemplated site of the city, and finding itself unable to recommend the adoption of any one of these designs, resolved, as an official statement naively expresses it, "to approve of the plan for the lay-out of the city as prepared by itself." This plan, the statement frankly admits, is made up of suggestions from many plans. Such an outcome, it may well be imagined, has infuriated our English cousins, whose patience had already been severely tried by the failure of the High Commissioners of Australia to amend the terms of the competition, and then by the capture of the prize by an American. The Town Planning Review editorially describes the now adopted design as "entirely outside the pale of serious criticism," and says that the perspective sketch which accompanies the plan is a reminder "of a third rate Luna Park." A study of the detail of the plan shows that this criticism is hardly too severe, but there is some gratification for America in noting that it has led to a better and fairer appreciation of Mr. Griffin's work by the sorrowful architects over the sea.

Report of Art Commission.

The Report of the Art Commission of the City of New York for the year 1911 has come from the printers in its usual attractive form. The number of matters submitted to the Commission during the year was 207—the largest number it has ever been called upon to consider in a year. Of the submissions, 174 were approved; 21 were disapproved, in whole or in part—a much smaller proportion than usual; and 3 were withdrawn, leaving only 9 unacted upon at the close of the year. The total amount of money involved in the matters submitted approximated $25,500,000.

The statistical report is as usual followed by a monograph suggested by the work and experience of the commission. The subjects discussed in the current report are tablets, ready made monuments and layouts. The Commission notes that tablets are frequently used as memorials because they may be inexpensive. It makes the comment that "while contrasted with other forms of monuments the tablet is inexpensive, nevertheless, a beautiful tablet cannot be cheap and in many cases the donors seem to fail to appreciate that it requires great skill and ability to design a beautiful tablet, and that adequate skill and ability must be paid for." The Commission opposes, also, the too familiar custom of bringing from a distance a large boulder and placing it in the midst of a green lawn and setting a tablet in it. "Tablets erected upon rocks and boulders," it says, "soon become merely black spots upon light surfaces. A beautiful inscription carved in the boulder or granite itself, or a granite or marble slab set into the rock, usually would be far more suitable." In short, the Commission urges that tablets should be looked upon not merely as records, but also as works of art. With reference to monuments, it protests against the practice of submitting to it completed monuments which have been designed at a distance without particular reference to the exact site which they are to occupy. Under the heading of Layouts, it enunciates the principle that where it has given its approval of plans for a group of buildings, it cannot approve of a design, however meritorious, for a single structure or for an addition to an existing structure, which would render impossible the execution of the group plan, unless a new group plan be also submitted and approved.

To Limit Building Heights.

An act has been drafted in Pennsylvania "to empower cities to create from one to four districts within their limits and to regulate the heights of buildings to be thereafter constructed within each district." The act is thus based on the principle which was upheld by the Supreme Court of the United States in the Boston case of Welch vs. Swasey. The preamble of the act states that it is designed "to protect the health of the citizens . . . and to promote the safety of public and private property." A maximum height limit of 250 feet is named in the act, but a lower limit may be placed, and the act explicitly declares that "in prescribing the regulations for any district, the city may fix either an absolute limit of height for the whole or a part of a building based upon the width of the street or streets upon which it abuts, or it may adopt some other system, and the city may provide for one system in one or more districts and a different system in others, but the system prescribed by any district must be uniformly applied throughout that district. The said regulations may further provide for a greater elevation of buildings which recede a certain distance from the building line of the street." Regulations may also apply to the alteration of buildings as well as to new buildings.

In discussing this subject, D. Knickerbacker Boyd, writing to the Philadelphia Public Ledger, proposes that "any owner who contemplates erecting on any given street a building which by its very size and nature will attract more people and more business to that particular portion of the street than it can reasonably be expected to accommodate, or worse still, than it actually will accommodate, should be made to furnish a somewhat adequate amount of space, or rendezvous, in front of it." He therefore suggests that the height of buildings erected on the present regularly established building line be limited to one and one-quarter times the width of the street or open space upon which the structure faces. This would give on a street 50 feet wide a 62½-foot high building (if erected at the usual building line), which would be equivalent to a six-story building used for residential or office purposes or a five-story light manufacturing establishment. Any building taller than this initial height should then, he thinks, be so set back that the cornice or top of its perpendicular

face shall not extend above an imaginary line, which might be called the "building and height line." If this imaginary diagonal be drawn from the curb of any of these streets, assuming the sidewalk to be one-quarter the width of the street, to the top of any building which is the limit of height above mentioned at the normal building line, and continued into space, it becomes the line of restriction. Thus to go up one must go back. This scheme, therefore, forces the entire perpendicular face of the building back from the curb in a fixed proportion to each additional story the building may go up, which can be roughly figured upon as a two-foot increase in the width of the sidewalk for each ten-foot story above the initial height.

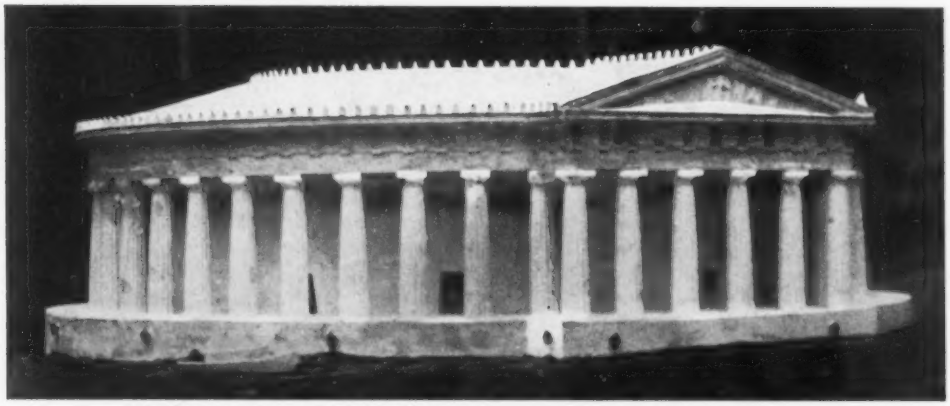
There is this to be said for Mr. Boyd's scheme, as compared with the idea of permitting above a given height only tower construction which shall use but a small part of the floor area, that the unused ground area is now placed where it is of public value.

Prize Winning Designs

The awards in the competition conducted by the City Club of Chicago for the layout of a quarter section of land as a residential subdivision were announced on March 17th, at a dinner held at the City Club. The first prize, which was $300, went to Wilhelm Bernhard, architect, of Chicago; the second prize of $200 to Arthur C. Comey, landscape architect, Cambridge, Mass., and the third prize, $100, to Albert Lilienberg, chief of the Town Planning Commission of Gothenberg, Sweden, Mrs. Ingrid L. Lilienberg collaborating. The widespread interest which this competition aroused, as indicated by the awards, is significant. As the awards show, this interest spread far professionally, and far geographically, and certainly the amount of the prize cannot be held responsible for it. All the competitive plans are now on exhibition at the City Club in Chicago where they will remain until June 15th. In the meantime, a long series of luncheons, dinners, and evening meetings has been arranged for the discussion of housing policy. The prize winning designs are all interesting, and it is stated that the vote of the jury was unanimous in each case. The plan which won the first prize is the most informal of the three, and makes a special feature of reservations in the interior of blocks. Both the prize winning designs submitted by Americans show some curving lines. On the plan which won the third prize, and which comes from Sweden, all the streets are straight, though there are many angles, one feature being an octagon within the square. In each of the prize winning designs the standardization of streets has been carefully avoided.

An Important Decision

Of exceptional interest to architects and city planners was a decision handed down in March by Judge Sulzberger of the Common Pleas Court of Philadelphia. The question was whether the excess condemnation act of 1907, which authorizes Pennsylvania cities to acquire property within 200 feet of parks, parkways and playgrounds in order to re-sell with restrictions, was constitutional. The decision held squarely that it was constitutional. Andrew Wright Crawford, assistant city solicitor of Philadelphia, and the man who drew the act, writes that "the decision establishes a precedent that will be noted throughout the country, especially because of its effect on city planning so far as it concerns the reconstruction of the central areas of cities. During the last ten years there has been no decision of as much importance to the physical city. Even the case of Welsh vs. Swasey, which holds that cities may adopt different height regulations in different districts after proper legislation by the State legislature, and thus points the way to the adoption of the German zoning system, is not so far reaching." It is stated that an appeal will be taken to the Supreme Court of the State, but Judge Sulzberger's analysis of the purpose and meaning of the parkway undertaking has put great courage into the hearts of the friends of the act. In one place in his decision, he says, referring to a previous act, sustained by the courts, for the encouragement and assistance of companies organized to promote expositions: "If the Parkway from the City Hall to Fairmount Park may be made to exhibit the best results of architectural skill and of industrial achievement in the building art, it would seem to be an exposition quite as useful as if it were devoted to the arts of agriculture and horticulture. The utilitarian feature that the avenue will attract strangers from abroad, and thus benefit the city's general trade and commerce, detracts nothing from the educative quality."



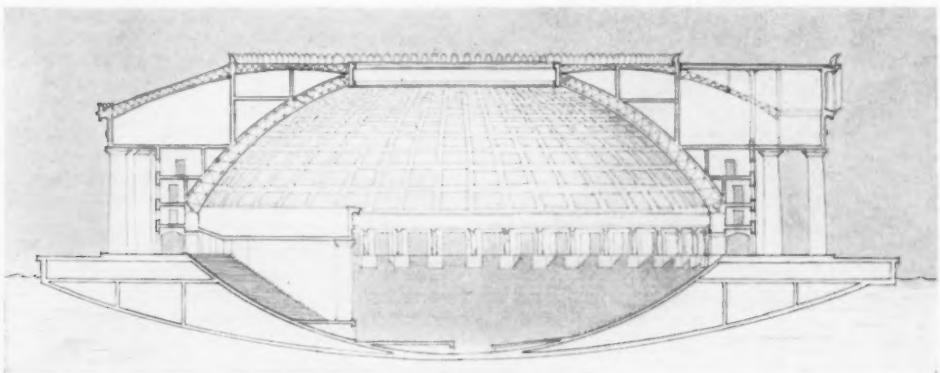
PHOTOGRAPH OF THE MODEL FOR THE FLOATING CIVIC THEATRE.
Robert Paine, Engineer.

A Novel Project

A plan for a Civic Arts Building illustrated by a sketch model at the recent exhibition of the Architectural League, more than answers the question of a site for this much needed institution. Sites in the parks for buildings to serve some part of this urgent requirement have been asked for and refused. Meanwhile the art societies and patrons of art have considered various sites, but the cost has been prohibitive. This latest plan provides its own site at no cost whatever. While before this space barely sufficient for exhibition galleries has been thought of, this plan not only provides abundantly for exhibitions and schools, but the largest feature and central idea is a great civic theatre for dramatic and musical entertainment on the largest desirable scale. It would also provide a forum for the discussion of public art and other civic matters.

This building which fills these multifold needs does so by being constructed upon a bouyant concrete foundation which could be moved on one of the city's park water fronts—the Battery Park being the first suggestion.

The sketch shows a severely classical building of large scale, circular in form with a peristyle broken by a six column portico at the principal entrance. This facade stands upon a broad terrace-like platform, broad enough outside the colonnade, it has been suggested, for a foot race course for athletes. This platform arises vertically from the water line where it is found to be the continuation of a great spherical, though comparatively shallow, bowl of heavy reinforced concrete. Continuous with the inner edge of the annular platform, inside the colonnade and circular wall of the building, is a second or inner



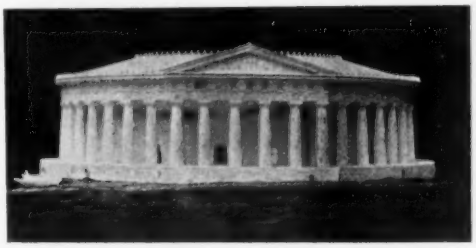
A SECTION OF THE FLOATING CIVIC THEATRE (Section Through Stage).
Robert Paine, Engineer.

bowl of smaller radius, down the sloping sides of which are ledges in tiers to receive the seats of the theatre. The outer and inner bowl of the foundation are built integrally in the lower and central part and are also joined by a series of radiating walls which divide the intervening space into as many compartments. This construction is seen in the accompanying cut.

From the inner edge of the platform around this bowl spring a series of dome girders, one over each radiating wall in the foundation. These girders, with the circular wall and colonnade, carry the upper building, which affords a vast extent of well lighted gallery space. The contour of the dome as well as the scale of the whole plan will be made to conform to the calculations for acoustics.

It is proposed to divide the space of the bowl into a larger and a smaller theatre, it being possible upon occasion to make the latter auxiliary to the stage of the former. This stage is a compromise between the modern stage and the stage of of the antique Greek theatre, which the general design suggests. The style of architecture is so well adapted to the foundation plan that it renders the whole peculiarly satisfying. In the greatest works of the greatest ages it is doubtful if the architect and engineer were so widely separated as is proverbial in this age of extreme specialization. It is too seldom that both are united in one man as is true in this case—Mr. Robert Paine being both the inventor of the foundation and the designer of the building.

To build a theatre of artificial stone, resting upon the water instead of cutting it from solid rock as in classical times is a thoroughly modern conception; to unite

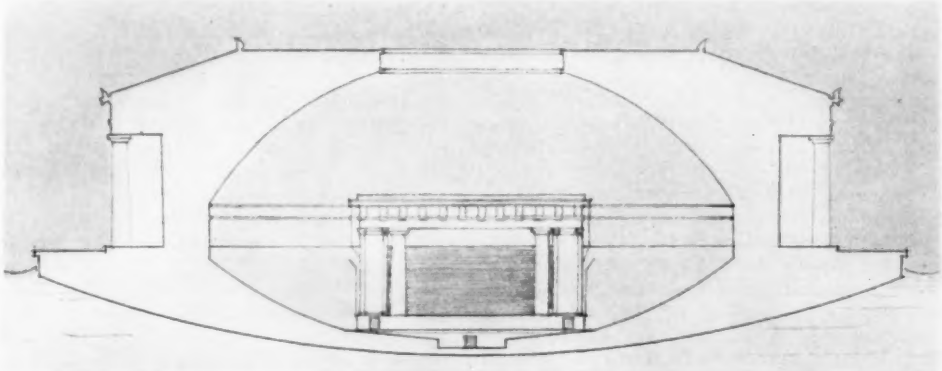


A PHOTOGRAPH OF THE MODEL FOR THE FLOATING CIVIC THEATRE.
Robert Paine, Engineer.

on this advantageous ground plan a design to satisfy a manifold civic need is an architectural conception in the broadest sense.

A Valuable Report.

One of the most valuable additions which has been lately made to the American city planning library is the recently issued annual report of the Director of Public Works and of the Chief of the Bureau of Surveys in Philadelphia for the year of 1911. Though appearing about a year late, its interest from a city planning standpoint is of a permanent character which does not suffer from the delay. For in this report there are produced all, or certainly almost all, of the maps and plans which gave such unusual distinction and interest to the exhibit of Philadelphia itself at the national City Planning Exhibition held in that city in June of 1911. Furthermore, these maps and plans are supplemented by descriptive text. Thus the student of city planning has in this paper-bound official document, issued in the ordinary course of administrative



A SECTION OF THE FLOATING CIVIC THEATRE (Section Toward Stage).
Robert Paine, Engineer.

routine, a concrete discussion by practical men which possesses exceptional value. Six large maps are devoted to the street system, ten maps and plans to parks, squares and traffic places; two to river front improvement, three to steam railroads, seven plates to the new parkway, while a number of others illustrate miscellaneous undertakings.

Architecture for Delhi.

Very lively is the controversy, both in and out of professional circles, over the style of architecture to be used in designing the principal public buildings of the new capital of India at Delhi. At a session of the Imperial Legislative Council last year, Lord Hardinge announced that he believed that the prevailing architectural style of the new city should be an adaptation to modern needs of one of the several Indian styles. In this attitude it is said that Lord Crewe supported him, as did many other friends of India whose sensibilities have been aggrieved by the inappropriate, and often ugly, Renaissance and Gothic monstrosities which the department of public works in India has erected. On the other hand, there are many, of whom it appears Lord Curzon is a leader, who maintain that the spirit of the new capital should be as English as the rule it typifies. It seems that a like difference of opinion exists between the two advisory architects sent out from England—Mr. Luytens and Mr. Lanchester, the sympathy of the latter being with the advocates of an adaptation of local designs. The English "Town Planning Review," jumping into the melee, editorially calls attention to the following points: 1, "The so-called new capital city of Delhi cannot, after all, be anything more than a European section of an Eastern town of the same name. 2, To make this European settlement really typical of modern civilization, the style of architecture will have to be something much less vernacular than the work of Inigo Jones and Wren. We must remember that Palladio's material was stucco translated by Wren into stone, and that where marble is possible we must look for a more refined inspiration, and cannot help but refer to its use by the Greeks. A third point which must be remembered is that in modern India there is a great wealth of native talent which should not be entirely ignored." It then adds this opinion: "We can conceive of an absolutely modern building inspired by the rich delicacy of Hellenistic Greece, which would naturally assimilate much of the gorgeous decoration of the East. The Palais de Justice at Brussels, though modern and European in every essential, is certainly based on an Oriental, if not Indian, inspiration."

A Farm House Competition.

A model design for a farm house is the interesting subject of a competition which has been held this winter under the auspices of the Minnesota State Art Society. It was required that the farm house designed should cost not more than $3,500, and that the winning designs should become the property of the Society with the understanding that they would be placed at the service of such farmers or others as might care to use them. Cash prizes amounting to $500, and a medal and a diploma were offered. The judges are an architect, a contractor and a farmer. The competition has had the backing of the State Agricultural College, and it is proposed to construct on the College grounds a farm house which will illustrate the premiated design, while its interior decorations and furnishings are to be planned and executed by the college students. Girls students from the college will hereafter occupy the house in groups of three or four at a time during the scholastic year. Undoubtedly under these conditions the competition will result in the performance of excellent missionary work. Undoubtedly there will be received many practical suggestions making inexpensive additions to the convenience and comfort of the usual type of farm house, and perhaps even offering economies that will offset the expense of better design or decoration or unusual comfort. At the same time it is to be remembered with some misgiving that the normal farm house, however considerable is its obvious shortcomings, tends to conform to a general type which so varies in different localities that, given a farm house, one can usually tell the section of the country in which it is located. This circumstance gives to its design, for all its faults, a significance and dignity that makes one a little fearful with regard to the general adoption over a large area of a design made on a city draughting table by a man who is working for a prize.

Monroe Building, Chicago
is Luxfer Daylighted

The Dollars and Sense of Daylight

Holabird & Roche,
Architects.

The bigger the building, the bigger the daylighting problem.

Few office buildings, hotels, apartment houses, etc., can claim daylight throughout. There are always some rooms or suites that rent cheap because of insufficient natural light.

Luxfer puts daylight where it's needed.

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